

# Bloomberg Businessweek

December 8 — December 14, 2014 | [businessweek.com](http://businessweek.com)

ANNIVERSARY ISSUE

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KITTY LITTER

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SEXUAL HARASSMENT

MICROCHIP

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# THE LARGEST TOOL IN THE TOOLBOX

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Today, any small or medium-size  
enterprise can assemble its own  
customized commercial fleet

**F**iguring out what customers need may seem like common sense for any manufacturer, but RAM Trucks has grabbed its target market by the horns—and left the competition in the dust—by mastering this surprisingly complicated formula.

When RAM Truck, a spinoff of the Chrysler Group, spun off from Dodge in 2009, it set its sights on “real truck customers.” Since then, the standalone company has nearly doubled its market share in North America, and seen its pickup truck and chassis cab sales climb from 257,000 to 463,000 in just four years. “We’re truck guys building trucks,” says Joe Benson, Head of RAM Commercial Brand. “By doing that, we can dive deeper, deliver on what customers want and become the largest tool in their toolbox.”

RAM continued its growth spurt by entering the North American commercial van segment with the ProMaster Van in late 2013. The company took a proven platform—the Fiat Ducato, which has sold more than 4 million vehicles internationally—adapted it for American roads and climate, and delivered a front-wheel drive Class 2 van that offers better payload and lower running costs than its competitors. Only a year later, the company has already grabbed 10 percent of this key Class 2 van market.

According to Benson, RAM’s competitive advantage is front-wheel drive in a market dominated by inefficient, V8-powered rear-wheel drive vehicles. “The front-wheel drive system cuts down on weight, eliminates

the prop-shaft tunnel and allows us to offer a best-in-class, low, flat floor and best-in-class payload of 4,440-pounds, a best-in-class cargo capacity of 550 cubic feet and an engine that delivers incredible fuel economy,” Benson says.

Other features that win customers over, Benson adds, are the van’s step-in height of 21 inches (“more efficient for the operator”); an interior height of 76 inches (“a 6’4” tradesman can stand in the cargo area while using it as a mobile workshop”); doors that open to accept standard pallets (“clearance to use a forklift”); as well as a nifty three-part modular front bumper to lower repair costs (“you don’t have the cost of replacing the whole bumper in the case of an accident”).

“We give our customers more space, payload, fuel efficiency and lower total cost of ownership,” Benson notes.

Next up is RAM’s entry into the smaller Class 1 cargo van category with the ProMaster City—a reconfigured version of the Fiat Doblo that was twice named International Van of the Year. The new ProMaster City is at home in congested urban areas and is ready

to work, with a 1,833-pound payload and 131.7 feet cargo of volume—both best-in-class figures—as well as details like storage for folders, clipboards and computers that enable the van to function as a mobile office.

“One of the primary purchase considerations for commercial vehicles is total cost of ownership, which includes fuel efficiency,” Benson says. “The ProMaster City features unsurpassed standard highway fuel economy at 29 miles per gallon, combined with best-in-class horsepower and torque via our 2.4-liter Tigershark engine and exclusive 9-speed transmission.”

In addition to its innovative vehicle portfolio, Benson attributes RAM Commercial’s accelerated growth to its enlarged network of 925 dealers. This team supports customers with both pre- and post-sales care, creating a one-stop shop for maintenance, upfitting and other needs, including such simple but crucial steps as putting logos on vans.

In the downturn, many cash-strapped businesses delayed replacing their vehicles. In fact, Benson says, most of the 3 million fleet vehicles on the road today are more than a decade old. But an increase in sales seems inevitable in an economic turnaround—and RAM Commercial is poised to supply this demand. “As customers come back, it’s essential we deliver on their needs,” says Benson. “Whether it’s a light-duty truck, a heavy-duty pickup or a van, our product portfolio has best-in-class features right through, so we’re confident we’ll meet their demands.” — *John O’Mahony*

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1 Based on standard pickup class. EPA estimated 28 highway MPG based on available EcoDiesel V6 4x2. Actual results may vary.  
2 350/3500 pickups. With available Cummins® Diesel when properly equipped. 3 Based on class 3-5 pickup-based conventional cab chassis over 10,000 GCWR. 4 Based on Small Commercial Van segment. EPA estimated 18 city/26 highway with 20-gallon fuel tank. Actual results may vary. 5 Based on Class 2 Cargo Van (single rear-wheel axle). 6 See dealer for details and a copy of Limited Warranty. 7 Includes \$500 On The Job Upfit Bonus Cash Allowance on 2014 and 2015 Ram Commercial vehicles (Ram 1500 Tradesman model only). Must take delivery by 1/5/15. See dealer for On The Job incentive details and eligibility requirements. Ram, Ram ProMaster, BusinessLink & Design and On The Job & Design are registered trademarks of Chrysler Group LLC. Cummins is a registered trademark of Cummins Inc.



# M

## MARTIAN NOTIFIER

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## The Leading Edge of Wearable Tech

**From voice commands to texting, the timepiece's evolution continues**

Not long ago, few could have imagined that the wristwatch would ever be more than an ornament that looks pretty and tells time. However, with the rise of the smartphone, as well as lifestyle apps clamoring for attention, the watch is evolving into the most practical way to connect wearers with their smartphones.

"The 'aha' moment for us came when Apple introduced voice capabilities for the iPhone," says Stan Kinsey, President of Martian Watches, the California-based developer of fashion-focused smartwatches. "Our reaction was, 'Why should you have to pull your phone out of your pocket to use Siri? That's inconvenient.'"

Martian's solution, the Martian Voice Command line of smartwatches, is equipped with a microphone and speaker, which allows users to keep their phones in their pocket or purse while making calls, receiving alerts and notification, texts, reminders and lots more. On the strength of sales numbers and design awards, the company launched a companion product this year, the Martian Notifier, with a sporty design and a deep focus on custom notification features, at a lower \$99 price point.

Kinsey believes Martian has two competitive advantages. First, the Martian Notifier looks like a traditional analog watch, with a one-line OLED readout added, rather

than a flat-screen digital display. Plus, Martian watches can be had in a number of colors and shapes. "Research showed that 70 percent of the market wants a traditional look that is fashionable," says Kinsey, who points to a new co-venture with Guess, the upscale clothing brand.

The Martian line's other compelling feature is its "Smart Notification" system—an industry first—that allows wearers to set distinctive vibration patterns to let them know if they've received an email, text, call

or tweet. If they can't look at the watch to see the notification, a tap of the watch glass within five minutes brings it back. The dedicated app will also program other alerts and alarms—your standard wakeup call, for instance—and screen out notifications that aren't high priority.

**People look at their phone to check messages an average of 150 times a day**

Since people look at their phone to check messages an average of 150 times a day, Kinsey believes it's inevitable that they will embrace the most convenient way to do it. "Analysts forecast exponential growth, and that's because the smartwatch is really useful," he says. "You can't use a phone safely while driving, for example. So isn't it obvious to have a watch with voice commands that interacts with your phone? It's the reason I believe the demand for smartwatches is just beginning." ●



# Picture Perfect

Stay in the moment with  
the camera that decides what  
to shoot for you

**Autographer** may seem even more basic than your old digital camera—it doesn't have a viewfinder or preview screen—but its looks belie the smart technology that drives it. Need proof? This camera makes its own decisions about when to snap a picture.

Weighing a little over two ounces, lighter than most cell phones, Autographer is designed to be worn and forgotten, so that users can stay in the moment while still documenting the world around them.

"Think of those fun occasions where the last thing you want to do is grab a camera, tell your friends to say 'cheese' and end up with lots of posed photographs. That's over," says Simon Randall, Managing Director of OMG Life, part of OMG plc, a leader in developing motion-capture systems for the entertainment industry. "Not only are you fully engaged in the moment, but you can collect an amazing set of images you wouldn't have gotten otherwise."

Autographer's technology uses six sensors—including GPS and an infrared light that detects movement—to collect data about the camera's ever-changing environment. An algorithm analyzes the data and, when the environment changes, snaps a picture. The camera, which has a 136-degree lens and 5-megapixel resolution, can take about 200 images an hour and store them on its 8GB internal memory.

Photos are automatically tagged for easier sorting, and the camera also syncs up seamlessly with phones and other mobile devices through Bluetooth. In addition, it comes with an editing package, so users can compile images into

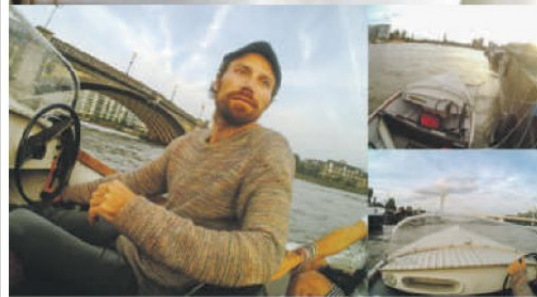
albums, animated GIFs or short videos.

Originally conceived as an intelligent camera targeted at the medical market to help patients with brain injuries recover memories, OMG has since refined the product with better image-capturing and editing software. The consumer market has responded in kind. Whereas Autographer, which sells for \$399, was once available only online, now it's carried by retail stores including Apple and Best Buy.

This organic evolution leads Randall to believe that the same ground-up innovation that inspired Autographer's development will drive future growth. Proof lies in the testimonials from early adopters, like the man who started logging his life and realized he spent too many family dinners glued to his phone. Says Randall: "Because customers like him continue to tell us they're finding new uses for Autographer, we're confident it is here to stay." — *John O'Mahony*

**"Not only are you  
fully engaged in  
the moment, but  
you can collect  
an amazing set  
of images."**

Sometimes you just  
want to live, not shoot



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# Combating Counterfeiting



## Fujifilm is using its cutting-edge counterfeiting prevention solutions to open up new horizons in security.

The counterfeiting of popular brand products continues unabated worldwide with damages said to reach about \$250 billion(USD)\* annually. As the methods used by counterfeiters grow increasingly sophisticated, it is becoming more difficult to recognize fake goods. Customs and law enforcement officials need new security technology that can reliably identify counterfeit products. Fujifilm has developed FORGE GUARD™, counterfeit prevention labeling, that when scanned with a special viewer, displays an invisible color pattern that can verify authenticity. This unique system for displaying images comes out of a wide range of proprietary technologies developed by Fujifilm over its many years in the field of photography. Our effective and innovative technology can protect the value of honestly-made goods. Fujifilm's proprietary counterfeiting prevention solutions help brand owners keep a sharp watch over their products—from everyday consumer items to commercial and industrial items.

\* Based on data from 'OECD (2009), Magnitude of Counterfeiting and Piracy of Tangible Products : An Update <http://www.oecd.org/sti/ind/44088872.pdf>

*80<sup>th</sup>*  
Anniversary

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## EDITOR'S LETTER

Let's not tiptoe around the obvious: We're old. Eighty-five is almost six years beyond the life expectancy of the average American, let alone the average magazine. We're old enough that when we warned in our first issue that the Dow Jones industrial average was at an unsustainable high, 1) that high was 381, and 2) we were proven right a few weeks later by the stock market crash of 1929. When we launched, many people still referred to Istanbul as Constantinople and parts of the world were still on the Julian calendar. We predate Clarence Birdseye's invention of frozen food and James Dewar's creation of the Twinkie. Older than Twinkies may as well be older than the earth itself.

Having established our endurance, we've decided to celebrate our anniversary by largely ignoring it. Weekly magazines should arrive bursting with the present tense, and our mission, unchanged since the beginning, is to deliver the world of business as it churns and thrives in this very moment. It wouldn't serve anyone to

march through our greatest hits. We'd rather celebrate the impact of yours.

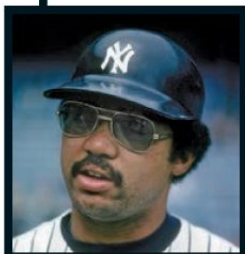
This special issue chronicles the most disruptive ideas of the past 85 years, those entrepreneurial earthquakes whose tremors are still being felt. Disruption is a trendy word, but it's used here without endorsement. To add a little tension, we've gone to the trouble of ranking these 85 disruptions and counting down to an overall world-changing champion. Comparing the importance of television to the impact of the Laffer Curve or Google to the AK-47 isn't meant to yield scientific results. It's meant to start some interesting arguments and remind us how dramatically business can change society.

Who knows whether we'll still be publishing in 2099, but it's fair to say *Businessweek* has been reborn in the five years since its acquisition by Bloomberg. It's nice to be at a company that believes in journalism and puts resources behind it. Just as important, we're challenged by our owner to take creative risks and tell our readers the truth above all else. It's enough to make a magazine feel young again. —Josh Tyrangiel



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© 1937 Simon Kuznets presents to Congress a research report called *National Income and Capital Formation, 1919–35*.

The biggest thing in the world is the gross domestic product of the U.S. To equal it would take the combined earning power of a dance line of Taylor Swifts 100 miles long. It's so big that writing out the number rounded-off to the next trillion puts you deep into a forest of zeroes: \$18,000,000,000,000.

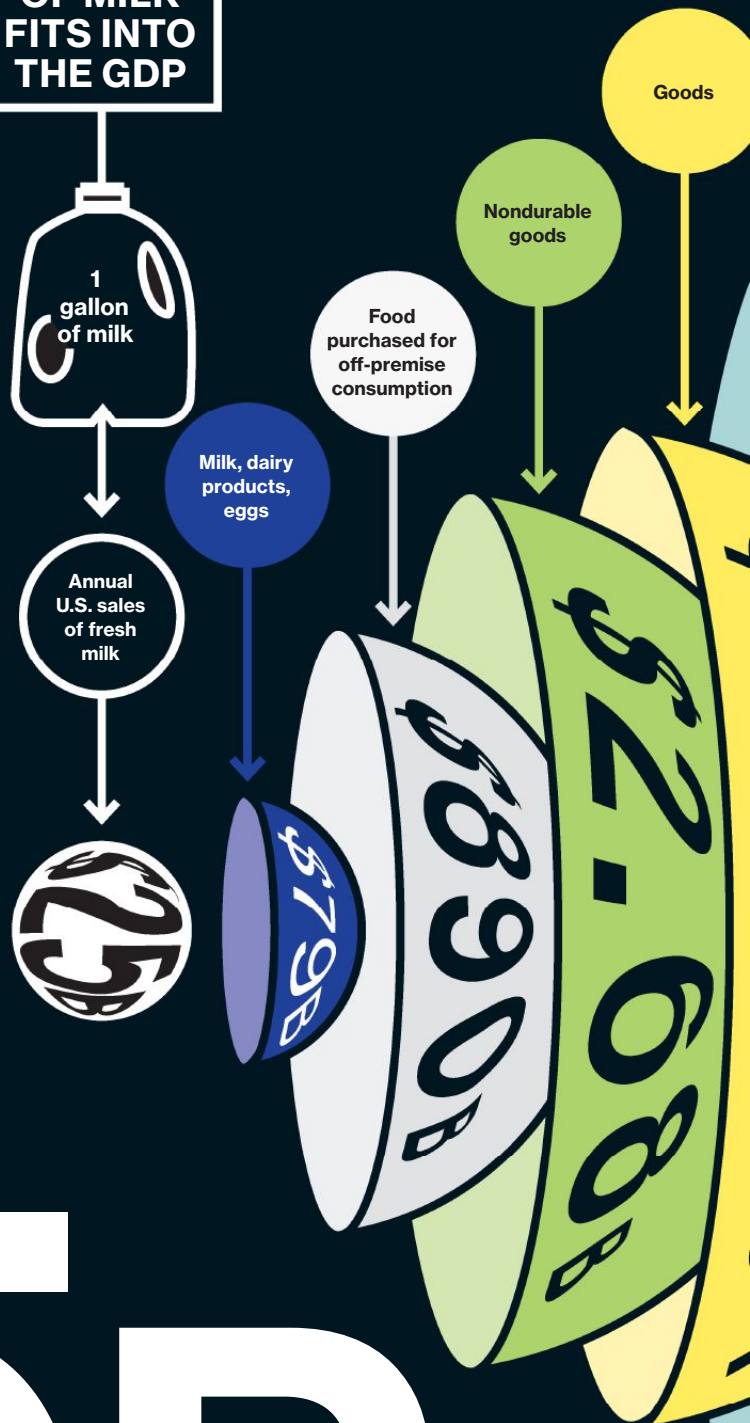
As big as it is, it doesn't actually exist. At least not in the physical realm. GDP is an organizing concept, akin to taxonomy or the periodic table.

GDP compartmentalizes a chaotic world, imposing order on the vast flow of daily transactions we call "the economy." It can be regarded as the sum of all output, or the sum of all expenditure, or the sum of all income. Conceptually, these three ways of attacking the problem should arrive at exactly the same number. That's elegant.

By the most familiar of the three definitions, the expenditure one, GDP equals  $C + I + G + (X - M)$ : consumption plus investment plus government spending plus exports minus imports. If you buy a laptop computer for personal use, it goes into C, consumption. If you buy it for work, it goes into I, investment. Thus accountants shape our perception of reality.

Getting a grip on GDP, including its thousands of components, empowers the planners in both Big Government and Big Business. It was conceived mainly in Great Britain and the U.S., first to understand and combat the Great Depression, then to organize war production to defeat the Axis powers. Imitation is the sincerest form of flattery: Today countries as different as China and Nigeria regularly report their GDP using a United Nations-developed standard called the System of National Accounts. In 1999, the U.S. Department of Commerce declared GDP "our greatest achievement" of the 20th century. —Peter Coy

## HOW A GALLON OF MILK FITS INTO THE GDP



# 85. GDP







## 83. Denim

§ 1936 Levi Strauss places the red tab on the right back pocket, with “Levi’s” stitched down its side, creating a craze for brand-name denim. —Kurt Soller



The forebear to the jeans we buy today was invented by Levi Strauss in 1873 for miners.

Levi's Red Tab 501s rose to prominence in the 1950s because of fans like Marlon Brando and Marilyn Monroe.

Levi's began stone washing in 1984, ushering in pre-distressed pants.

Designer denim boomed in the aughts—some sold for more than \$1,000—then went bust during the recession. Jeans still account for 20 percent of department store purchases and \$16 billion in annual U.S. sales.

## 84. POLAROID

§ 1947 Harvard dropout Edwin Land unveils the first Polaroid camera.

By Christopher Makos

Polaroids were the first social network. You'd take a picture, and someone would say, "I want one, too," so you'd give it away and take another. People shared Polaroids the way they now share information on social media. Of course, it was more personal, because you were sharing with just one person, not the entire world.

I met Andy Warhol in the '70s at the Whitney Museum and started doing projects with him because he loved my photographs. He'd never had a pal who was a photographer, so I was his guru, showing him what cameras to buy, what pictures to take. When Polaroid came out with its SX-70 model, the company sent big boxes of film and cameras to the Factory, which was at 860 Broadway (it's now a Petco). Andy loved Polaroid. Everything was "gee whiz"; it was brand-new. So immediate. I took photos of him with his new toy.

It wasn't about the accuracy of the technology; it was about the moment. I loved the intimacy that when you took pictures, it was just you and the person. Taking a selfie with a Polaroid is also very intimate. They weren't called selfies back then, obviously. People weren't as self-aware. We didn't have 10 years of reality TV shows in the social consciousness. But Polaroid marked the beginning of self-awareness. "No, I don't like that picture, take another"—that kind of talk came about. —As told to Caroline Winter



## 82. WHITEBOARD

Ⓜ 1937 Robert Mayall patents an erasable "white blackboard."

Who invented this icon of brainstorming, found in every modern startup? Of several rival claims, the earliest patent we could find was Robert Mayall's in 1937. He described an enamel-coated writing surface that could be wiped clean of pencil, crayon, and even ink markings for the effortless jotting and revising of ideas. (Dry erase markers came later.) The concept had been around for some time. Mayall refers to inferior "prior whiteboards," whose high gloss created too much glare. —Belinda Lanks

Ⓜ

**1948** Optician Kevin Tuohy files a patent for a corneal contact lens.

Leonardo da Vinci is credited with first conceiving of a water-infused glass lens that could alter a person's vision, but it wasn't until after World War II that companies began to produce something resembling modern contacts. The lenses, mostly made of Plexiglas, were designed to rest on the center of the cornea.

Further innovations followed: In 1959, Czech chemists Otto Wichterle and

Drahoslav Lím introduced soft lenses; 1998 saw the advent of oxygen-permeable soft lenses that could be worn long-term. Of the more than 39 million Americans wearing contacts today, 85 percent are wearing soft lenses, estimates the Vision Council, an industry trade group.

The most recent advances promise to turn contact lenses into diagnostic instruments: In July drugmaker Novartis announced a partnership with Google to commercialize so-called smart lenses, which can measure diabetics' glucose levels and transmit the data to a smartphone.

—Jeff Muskus

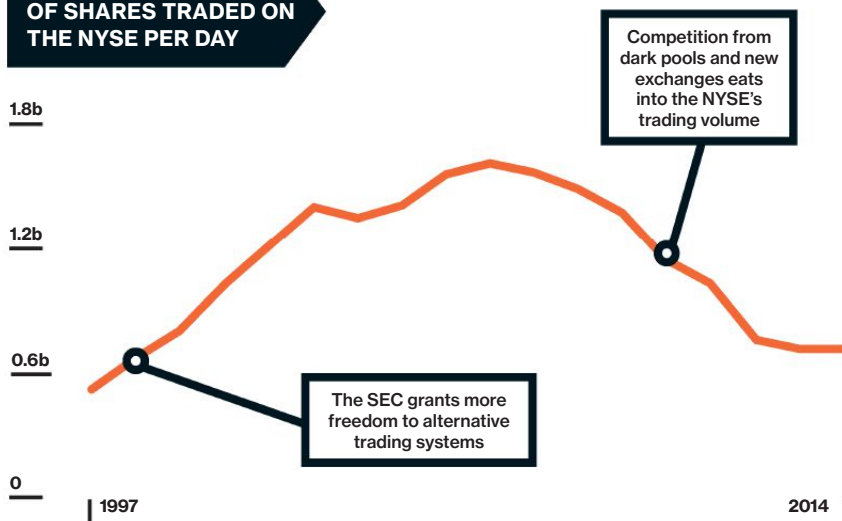
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**1998** U.S. Securities and Exchange Commission regulations open the door for electronic trading venues to become rivals to traditional stock exchanges.

The rise of high-frequency trading—the use of algorithms to buy and sell securities electronically at high speeds and huge volumes—is only the latest evolution in buying and selling stocks. The SEC’s decision to end fixed commissions in 1975 was amplified by forces that changed the nature of exchanges. As machines grew more complex, exchanges evolved from clubs where only certain brokers could trade to companies catering to everyone with an ETrade account. In 2000, when shares began trading in 1¢ increments, rather than by eighths of a dollar, matching buyers with sellers got easier. Trading volumes exploded as computers took over. In addition to rendering human traders practically obsolete, HFT is blamed for making stock exchanges less transparent and markets more volatile. Rightly or wrongly, it has disrupted the process of trading stocks that determines the value of public companies. —*Matthew Philips*

## AVERAGE NUMBER OF SHARES TRADED ON THE NYSE PER DAY



THROUGH NOV. 14, 2014. DATA: GLOBAL FINANCIAL DATA

**1975** An arbitration court ruling gives Major League Baseball players the right to shop their talents for the first time.

By Bob Costas

Late on the night of Oct. 21, 1975, one of the most iconic images in baseball history was captured: Carlton Fisk of the Boston Red Sox, desperately waving his arms, trying to win his long fly ball fair in the 12th inning of an epic Game 6 of the World Series at Fenway Park. It hit the foul pole and the Sox won, forcing a Game 7 the next night.

Yet that enduring moment was not the most defining baseball event of 1975. And not just because the following night Cincinnati, not Boston, won the World Series. The most significant moment of the baseball year came in December, in a decision from an arbitrator named Peter Seitz.

For years, Major League Baseball and its players’ union had fought over players’ desire to determine the teams for which they played. Led by the formidable Marvin Miller, the union’s head, and propelled by the courage of Curt Flood, an All-Star center fielder who had essentially walked away from the game a few years earlier rather than accept a trade, the players’ cause had been gaining steam. A few years earlier, a modest advance had earned them the right to have an independent arbitrator decide their grievances. In a case brought to that arbitrator in 1975, regarding the contracts of two pitchers, Andy Messersmith and Dave McNally, Seitz ruled that an arcane but critical section of the standard MLB player contract, the reserve clause, did not prevent Messersmith and McNally from leaving their clubs and signing deals elsewhere. With that, the era of free agency in baseball, and sports as a whole, began.

At the time, many fans viewed this as heresy: greed, as opposed to the fundamental right to choose where one works. Then again, there was some justification for concern, because a league is not exactly like other businesses. It’s a venture in which competitors must also be partners, with common-sense rules in place to govern competition and promote an attractive overall product. If players kept hopping from city to city, there’d be no continuity. No perennial favorites to

HENZ KLUTMEIER/SPORTS ILLUSTRATED/GETTY IMAGES





root for. No lasting connections. Worse yet—and for a long while this turned out to be true—the most coveted free agents would land disproportionately with the wealthiest teams, creating serious competitive balance issues. The players deserved their rights and the riches that came with them. But how to regulate it so that the sport would be as fair and appealing as possible?

Players and management battled for decades over what seemed irreconcilable interests. But in recent years their mutual interests have become clear. Baseball, which once regularly experienced strikes and lockouts, has not had a work stoppage in 20 years. Not coincidentally, revenues have grown astronomically.

Revenue sharing, expansion of the playoffs, and more sophisticated team-building approaches have created greater competitive opportunity across the board. Without going to war, owners and players both have prospered to the greatest degree ever. Would you rather have 50 percent of billions of dollars or 60 percent of a significantly lesser sum? The enlightened answer is obvious.

Meanwhile, for the modern, knowledgeable fan, the game has greater intrigue than ever. It's about what happens on the field, sure, but it's also about the front office game, which once was checkers and now is chess. At last summer's trade deadline, a fascinating flurry of deals for All-Stars showed how

the business of the game has positively evolved. Not long ago, most of these midseason trades were salary dumps—byproducts of baseball's small-market/big-market divide. Now, not so much. Instead, they're part of the game's compelling new narrative—one team gearing up for October, another retooling for the future—where the best teams skillfully manage the interplay among farm systems, trades, and, yes, free agency.

And freedom hasn't completely destroyed the idea of the "identity player." Cal Ripken Jr., Tony Gwynn, Chipper Jones, and Derek Jeter all put together Hall of Fame careers for one franchise. Clayton Kershaw, Joe Mauer, Yadier Molina, and David Wright are among the big names headed down the same path. But there are superstars, such as Albert Pujols and Robinson Canó, who choose to move, just as another future Hall of Famer once did. Five years after hitting one of the most famous home runs in baseball history, Carlton Fisk became a free agent and left Boston to sign with the Chicago White Sox. He'd go on to make four All-Star teams in Chicago and have his number retired by both franchises.

So free agency didn't mean the end of the world after all. It just made baseball fairer. And more interesting.

Reggie Jackson

# 79. FREE AGENCY



# 78.SMARTPHONE

📱 2007 Apple releases the first iPhone.

By now, most of us have had our little hand computers in our pockets for so long that it's easy to forget they didn't exist a decade ago. BlackBerry built a now faded empire on the idea that a cell phone could deliver e-mail, too; Apple put more than 30 other things in there. Think back to the last time you bought a GPS navigator, flashlight, camera, even an iPod. Unless you're especially outdoorsy, or love iPods, it was probably before 2007. —Jeff Muskus

## THINGS THE SMARTPHONE KILLED

Typing out a paper on a phone is still harder than on a **laptop**, but you can do it.

Google Play and iTunes are this century's **CD collection**.

Streaming music apps can substitute for the **radio**.

Don't go digging out your old **iPod**. It'll blow your mind.

The **Rolodex** was like a contacts list that could only get so overstuffed.

Your browser, or a host of apps, can replace **print news**. (But thanks for buying this magazine!)

There's even a **phone** in there! Technically!

Did you ever even own a **stopwatch**?

iBooks and Kindle apps can keep you away from **print books**.

**Paper plane tickets**: suitable for framing.

Clock apps are generally more flexible than the old **alarm clock**.

Unlike actual **flashlights**, flashlight apps don't need C or D batteries.

The **legal pad** isn't as compact as Evernote.

If you're under 25, you've never owned a paper **day planner**.

**Audio recorders**: for that Maxwell Smart vibe.







Streaming video apps look better than the picture on your **portable TV**.

Netflix is a lighter haul than your **DVD** collection.

This **camera** is a lot bulkier than the two in your phone...

...and your phone probably has a better lens than this **point-and-shoot**.

You couldn't take a Vine in the **video camera** era.

Your phone has **GPS** built in. Say hi to the NSA!

Guess what **calendar** apps replace?

True, **atlases** look better on coffee tables.

Pffftttt.

**Bar-code** scanner apps make comparison shopping easy.

No need for an old-school lodestone with **compass** apps.

Smartphones moved **watches** back into people's pockets. We'll see if smartwatches can put phones on our wrists.

Yahoo! Weather: more features than a **thermometer**, less mercury.

LOL **pedometer**!

Actually, solar-powered **calculators** are still pretty useful. Too bad you threw yours away.

The Mail app is the giant fish-shaped **mailbox** we deserve.



Few expenses were spared by GM CEO Alfred Sloan, as seen in this spiral staircase

77.

# Corporate Campus

18

**W 1956** Eero Saarinen builds General Motors a compound in the suburbs.

Credit the knowledge worker with the rise of the corporate campus. Beginning in the 1940s, enterprising companies such as General Motors, Bell Labs, and General Electric began building separate complexes for their R&D departments away from their urban headquarters. Modeled on the college campus, these labs were set on manicured quads. Moving researchers and scientists away from blue-collar factories, Louise Mozingo writes in *Pastoral Capitalism*, elevated their stature as innovators who could create new sources of profit. Soon, with more workers living in suburbs, companies relocated their entire operations to these campuses, leaving city skyscrapers behind. The General Motors Technical Center in Warren, Mich., created in 1956 by Eero Saarinen (who would also design iconic

buildings for IBM, Deere, and other giants), is considered the earliest and most influential corporate estate and was named a National Historic Landmark in October 2014.

Not every company could afford a starchitect, and the trend also yielded

bland, boxy eyesores just off highway exits. Decades later, Silicon Valley giants Google and Facebook supercharged the approach, creating small cities with so many amenities—free meals, gyms, dry cleaning—that workers resist ever going home. —*Belinda Lanks*

The center of Facebook's campus in Menlo Park, Calif., built in 2012, is called Hacker Square





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# 76. THE ORGANIZATION MAN

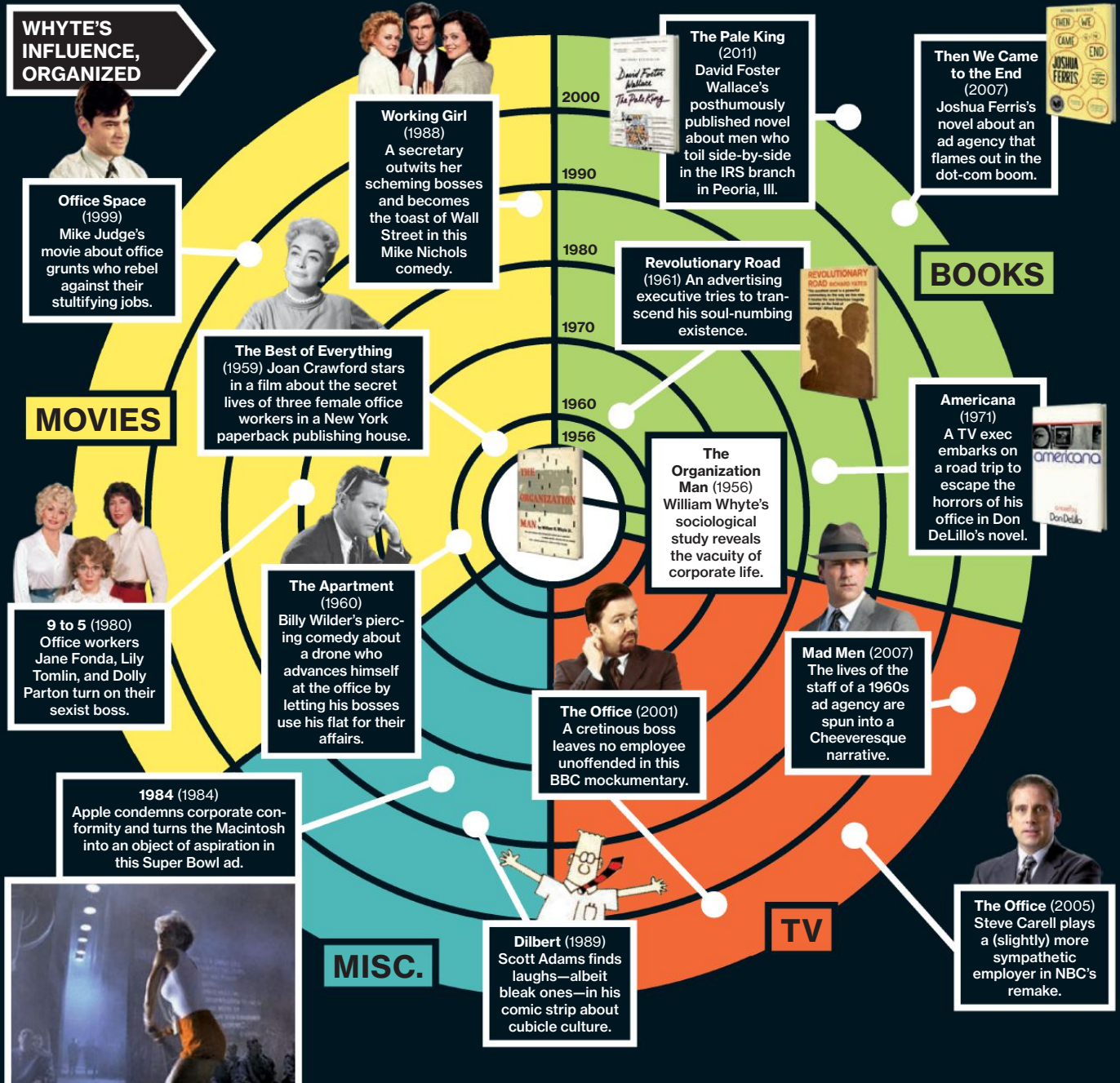
W 1956 Journalist William Whyte publishes his best-selling study of corporate culture.

William Whyte, a Princeton graduate and an ex-Marine who fought in World War II, arrived at *Fortune* magazine in 1946. It was a time of economic prosperity. Companies such as General Electric, IBM, and Kodak were growing rapidly and enjoying unprecedented earnings. But Whyte wasn't a balance sheet eyeballer. He was *Fortune's* resident sociologist. He wanted to explore the interior lives of the men (and they were almost entirely men) who toiled at these sprawling companies and look at how they were being shaped by the corporate culture dominating so much of American life. Whyte's research for the magazine provided the raw material for *The Organization Man*, his bestseller published in 1956. A critique of society as much as business culture, the book diagnosed groupthink—a term Whyte coined—in the suburbs as well as the boardroom, and became one of the century's most influential pieces of commentary.

Reading the book today, it feels dated and ponderous, but it's haunting, too. Whyte granted his subjects anonymity, and they offered him their secrets. He found chief executives so consumed with work that they couldn't sleep without a few highballs. He talked to lower-level executives who climbed the ladder, mistakenly believing they would find peace at the top. He visited the suburbs springing up around the country and spoke to the wives who were playing their roles as hostesses and, often, as neglected partners. Whyte also dropped in on colleges, where he described the next generation of men being indoctrinated into a way of corporate thinking that stressed conformity over individualism.

*The Organization Man* is an angry book, but Whyte was no anticapitalist. He wanted to save the corporation, not destroy it. He believed the Organization Man needed to be a maverick rather than a drone. The book ends with a primer on how to game the personality tests that companies were foolishly using back then to weed out the sort of free thinkers needed in the office. Whyte insisted that it wouldn't be hard for individualists to fool the test givers. "In all of us," he assured his readers, "there is a streak of normalcy." —Devin Leonard

20





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# 75

# PERSONAL

# FITNESS

1982 Jane Fonda's Workout comes out on VHS.

By Jane Fonda

I was looking to generate money for a statewide organization, the California Campaign for Economic Democracy, started by my then-husband and me in the late '70s. Around the same time, some wise person told me never to start a business I didn't understand. If there's one thing I knew well in my 40s, it was working out. I'd been doing aerobics with Leni Cazden, so we opened a studio together on Los Angeles's Robinson Boulevard. It was an immediate success. Barbara Walters and Merv Griffin asked to come shoot a segment there. Celebrities gave us free publicity. Then I wrote *Jane Fonda's Workout Book*, and it was on the *New York Times* best-seller list for two years. (That's why they

created separate categories—so a workout book could never again top Philip Roth.)

Afterward, Stuart Karl, who had been making home-improvement videos, approached me about doing a VHS of the workout that had previously only been a series of photos in the book. I said no! No one I knew even owned a VCR. The hardware was too expensive, and the industry didn't exist. Eventually I agreed, and it was that video that launched the home video industry. It sold 17 million copies; altogether, I released 23 videos.

Women, and some men, would do them with friends. You didn't have to join a gym—which, back then, were pretty much only for male bodybuilders. At the time, ladies weren't supposed to sweat, so hundreds of fans began writing me letters. A woman was doing it in a mud hut in Guatemala. Another woman said she was brushing her teeth one morning, saw a new bicep muscle, then went into work and told her boss to go f--- himself. I think it was Thomas Jefferson who said revolutions begin in the muscle. Now there are all these classes—spinning, yoga, CrossFit, and so on. But I had no competition back then. —As told to Kurt Soller

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# 74.VCR



**M** 1976 JVC introduces the HR-3300 video-cassette recorder.

The video-cassette recorder may seem quaint these days, but its emergence heralded the end of so-called appointment television—and spurred the rise of a range of technologies that populate 21st century living rooms.

## U.S. HOUSEHOLDS WITH A VCR



Today,  
49 percent  
have DVRs and  
82 percent have  
DVD players

**S** 1954 Tidy Cat, the first mass-produced brand of kitty litter, arrives in supermarkets.

By Paul Ford

Ed Lowe was working at his father's delivery business in southern Michigan when he had a brilliant idea: take some fuller's earth (a type of clay) and sell it to local farmers for chickens to nest. He called it Chicken Litter.

It was 1947. The farmers weren't interested—which is why Lowe had a big pile of it when a local woman came by. She'd brought her cat in from the January cold and needed some sand for her cat box. On an impulse, Lowe offered her some fuller's earth instead.

The stuff turned out to absorb the ammonia smell of cat pee. The woman soon came back for more. So did her friends. After enough requests, Lowe put some fuller's earth in bags, wrote KITTY LITTER on them, and dropped them off at a hardware store. The product sold, and it sold in supermarkets and pet stores. The market grew ever outward, from southern Michigan to the world.

The introduction of Kitty Litter meant that after millennia of scratching at the door cats could come indoors and stay there. They had long been visitors in American homes; now they were residents. In some ways it has been a hostile takeover: There are millions more cats than dogs in the U.S. This also means that Lowe is the indirect father of countless Internet cat memes. Anyone who sells recreational laser pointers, fuzzy mice, scratching posts, cat furniture, or electric-fountain cat water dishes should thank him, too.

Competitors appeared—after all, it was

dirt in a bag—but Lowe kept expanding the business, struggling at first to break out of his Michigan market, ultimately building a vertically integrated mining, distribution, and marketing concern. The 1954 launch of Tidy Cat, specifically for supermarkets, meant the cat waste category belonged to him. “We aim to stay No. 1,” he said, “in a No. 2 business.”

A research facility was built in Michigan. Dozens of cats were housed there. They scampered, played, and—given their ultimate responsibilities—probably ate rather well. Lab-coated materials scientists watched them. Absorbency and granularity had to be understood. Alternate materials such as paper were considered. A cadre of sniff-testers periodically came to the facility to test the product's quality and report on its effectiveness. Probably not the greatest job.

The beating heart of it all was Lowe. He looked like Kenny Rogers (they were friends) and had a manic entrepreneurial energy. He remembered your name if you worked for him and walked the floors of his factories and mines. “He called me one time,” says Michael McCuiston, who worked with Lowe and now works at Lowe's foundation. “It was in the middle of the night. He found a ranch in Florida that he wanted to buy.” Lowe sent a Learjet for McCuiston so he could look at the property and weigh in.

Real estate was a special interest, and Lowe amassed about 3,000 acres in Michigan. But he never really made it past the cat business. An old-timey town with amusements failed, as did

3  
KITTY  
LITTER

a line of pet stores and an experiment selling packaged firewood. He knew his own tendencies toward short attention and incredible enthusiasm and told his employees to keep him in line. They did, striking a deal: He could plow a steady percentage of revenue into new business as long as the bulk went back into the litter box. He agreed.

He left behind 93 short stories and 10 times as many poems, along with a play. In 1990, after more than 40 years in litter, Lowe sold the company to a group of investors for \$200 million plus stock. According to McCuiston, it was an anguished decision. Lowe had been estranged from his family, distanced from the product he invented and the company he created, now called Golden Cat. In his last years he put his energy into a foundation dedicated to supporting “second-stage” entrepreneurs—chief executive officers who have found initial success with a handful of employees but face the challenges of large-scale growth. He felt that his greatest struggle was taking Kitty Litter and Tidy Cat national.

Lowe died in 1995. His family put aside differences and gathered around him as he passed. Golden Cat was absorbed by Ralston Purina in 1995. Today the Edward Lowe Foundation sprawls across thousands of acres of southern Michigan. On the grounds are many endangered species of plants and animals: The cerulean warbler sings there, the eastern box turtle swims, and the cut-leaved water parsnip grows. But there are no cats.





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# 72.MOTOWN

**M 1959** Berry Gordy founds Motown Records.

**By Berry Gordy**

I wanted to do something that would make people happy.

So my question was, how do I turn that vision into reality? I was in Detroit. The time and place was very important. I tried writing songs and all that, but I had to eventually get a real job to make some money, and I went to the Ford Motor Co., and I worked on the assembly line. I would see the cars come in one door a bare metal frame and go out another door a brand-new car. Everybody was buying new cars—black people, white people, you know, Jews, gentiles. I got the idea to do my music business and have it like an assembly line, where artists would come in one door an unknown kid off the street and go out another door a big star.

People said I was crazy. I said, “Why not? We have the same feelings—white people, they’re sad and happy, and they get mad at the same things we get mad at.” I just felt that I could make music for all people, and I just had to figure out a method. We took the assembly line approach. We had a charm school and a production room, and we had classes, and we had producers, and we had writers. I would take a person like Smokey Robinson, who came to me, who was a poet but did not know how to write songs. I showed him how. Then others came along, like Stevie Wonder and Marvin Gaye, and they were better than I was for songwriting, so I had to move back into the business.

The business was always the biggest problem. I told Smokey one day, “I can’t understand. I’ve got five hits there, and they’re only going to play one.” And so he says, “I know, but what are you going to do?” And I said, “Well, I guess I have to get more labels. They’ll never know they are from the same company.” So we had several labels. We had Motown. We had Gordy. We had VIP. We had Tamla. We had different labels, because I found that disc jockeys only wanted to play one record from one company. In 1968 we had five records out of the top 10. They were on different Motown labels. That was my greatest year.

We were so busy making hits, I didn’t realize how relevant the music was until I met Dr. Martin Luther King. He told me that it was creating social and emotional integration long before his political and intellectual integration started. It was so inspiring to me.

—As told to Devin Leonard

The *Brady Bunch* kids meet the Jackson Five in 1971









# 71.

# SINGAPORE

**P 1965** Expelled from federation with Malaysia, Singapore becomes an independent state.

"Every time we look back on this moment...it will be a moment of anguish." So declared Lee Kuan Yew in a tearful press conference on Aug. 7, 1965, when Singapore announced its divorce from neighboring Malaysia. The split marked the birth of the global economy's most successful startup. Singapore was poorer than Jordan in 1965; now it's 10 times as rich. The World Bank ranks Singapore ninth in gross domestic product per capita, a place ahead of the U.S. By another measure—gross national income per capita on a purchasing-power basis—the country is second only to Qatar. Singapore's probusiness economic policies, high education standards, and rigorous social strictures have made it a model for developing nations across Asia and beyond.

—Evan Applegate and Romesh Ratnesar

## GROWTH IN REAL GDP PER CAPITA, 1965-2013

Singapore	World	U.S.	Jordan
<b>1,356%</b>	<b>146%</b>	<b>96%</b>	<b>34%</b>

DATA: WORLD BANK, BUREAU OF LABOR STATISTICS

## BUILT ON TRADE, BUT TIED TO ITS NEIGHBORS' FORTUNES



DATA: WORLD ECONOMIC FORUM, WORLD BANK, Z/YEN GROUP, OECD

## WORLDBEATER: RANKING SINGAPORE'S PERFORMANCE

<b>#1</b> ★ Ease of doing business	<b>#2</b> ★ Shipping container traffic per capita	<b>#2</b> ★ Global competitiveness	<b>#4</b> ★ Financial center
<b>#3</b> ★ Science scores	<b>#2</b> ★ Math scores	<b>#3</b> ★ Reading scores	

DATA: WORLD BANK, OECD PROGRAMME FOR INTERNATIONAL STUDENT ASSESSMENT, Z/YEN GROUP, WORLD ECONOMIC FORUM

# 70.

# BAR

**2 MILLION**  
Number of companies using bar code standards developed by GS1

A 10-pack of Wrigley's gum was the first product to be scanned with a GS1 bar code on June 26, 1974

**5 BILLION**  
Number of bar code-labeled products scanned worldwide every day

**B 1948** Aspiring engineer N. Joseph Woodland designs the prototype for a code containing retail product data.

A practically invisible technology, synonymous with efficiency, the bar code graces just about everything we consume. In 1973 the grocery store industry chose to adopt the universal product code, or UPC, as the single standard for product identification. The following year the Uniform Code Council, renamed GS1 US in 2005, was formed to establish a global, standardized bar code symbol. Today, bar codes are integral to industries including shipping, food services, and health care. —Shawn Hasto

DATA: GS1 US



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**M** 2006 Twitter co-founder Jack Dorsey sends the first tweet on March 21.

**By Curtis Sittenfeld**

The truth is that I joined Twitter because of Judy Blume. It was September 2012, and Blume had just tweeted for the second time that she was a fan of my work. (Yes, I'm name-dropping here, but if Blume announced twice that she liked your writing, wouldn't you?) I wanted to acknowledge these compliments, and the simplest way to do so seemed to be by signing up.

However, due to the online equivalent of shy bladder syndrome, I didn't send a tweet for 10 months. Yet not being part of any form of social media—I also had joined Facebook but was similarly inactive on it—was starting to feel absurd, even precious. For one thing, I sent joking texts, sometimes with pictures attached, to my husband or siblings or friends, and wasn't that all Twitter was, except public? Plus, if I didn't use social media, did that mean that at some fundamental level I didn't understand how a lot of people were leading their lives?

Then of course there was the matter of selling books, which is one of the things that, as a writer, I was supposed to do. When my fourth novel was published in June 2013, I noticed that in various cities, significantly fewer of the young female readers who'd accounted for most of my audience in the past

I've definitely realized my goal—perhaps to a fault—of understanding the role social media plays in people's lives: when they (now we) check it, and what it means to favorite or like something, and what prompts someone to post a picture of an experience they're having. It's fun to joke around with others about a TV show you're obsessed with. It's fun to see pictures of two people in the same field hanging out—which is why I've tweeted photos of myself with other novelists, including Yiyun Li and Mohsin Hamid. And it's surprisingly fun to connect with total strangers, at least when they're witty and smart. As one saying goes, Twitter makes you like people you don't know, and Facebook makes you dislike people you do.

As a St. Louisan, I've closely followed Twitter in the months since Michael Brown's death—tweets come from people on the ground in Ferguson, rather than in studios in New York or Washington. Although I recognize that information hasn't been checked for accuracy, I'm not alone in relying on Twitter. The day of Brown's death, in August, when I started following a St. Louis city alderman named Antonio French, he had fewer than 4,000 followers; when I last checked, he had 120,000.

I used to have an unscientific theory that the Internet has changed our mental metabolism, offering us countless micro-updates on countless topics yet in the process only stoking our appetites and making us more jittery and hungry. I believed my friends who obsessively checked social media were doing the equivalent of filling up on junk food. While

# 69.TWITTER

30

showed up at my readings. I suspected that these women were no longer hearing about book events in "traditional" ways such as bookstore e-mails.

And so I started tweeting, mitigating my wariness by establishing rules: I would not tweet about my children; I would not be mean; I would not respond to anyone who said something rude to me. I would tweet twice a day every weekday and take weekends off.

More than a year later, if I haven't broken all my rules, I've come awfully close, and except for when I hate Twitter, which is 10 percent of the time, I love it. I love its silliness and its arbitrariness and its sense of community. I see tweets as somewhere between writing and talking, and if I felt pressure to deliver a bon mot every time I spoke, I'd be mute. Not each tweet I send is hilarious or wise; there are some I'd revise, if Twitter were a medium in which revision made sense. And though I'm not "on" Twitter while writing fiction, Twitter has undeniably affected the way I work. In the past, I've tracked down friends of friends to get details right for novels, but now I ask the Twitter hive: How many new ER residents would there be per year in a 400-bed hospital? What's a Cincinnati restaurant where two preppy, spoiled young women would meet for lunch? Yes, I could find the name of a bistro on Yelp, but would it really be considered trendy by locals or would it just be pretending to be trendy? Trust me, Twitter knows the difference.

I haven't renounced this theory entirely, I now see Twitter quite differently, as a preview of what will be discussed in the mainstream media. These days, it's usually Twitter where I'm first exposed to breaking news, pop culture, and people who are about to become famous. More than once, I've read someone's musing tweets and, days later, read a formal article by the same person on the same topic; they were, whether knowingly or not, brainstorming on Twitter, or testing the waters.

I've also realized that I was vastly overestimating the number of people on Twitter. When I'd see a commercial for JCPenney, say, with that little @ sign, it felt like everyone besides me—Penney's shoppers the world over—was on Twitter. But if I visit a 12-member book club in St. Louis, typically one woman is on Twitter, one doesn't participate in social media, and the other 10 are all on Facebook. I'm pretty sure this means that, despite its special standing among journalists and writers and its resulting outsize influence, I've embraced something relatively quirky and peripheral—the artisanal pickle of social media, if you will.

I'm actually skeptical about whether being on Twitter has caused more of my books to sell, but I'm enjoying myself enough that I'm in no hurry to leave. Not long ago my brother P.G. told me, "You shouldn't be embarrassed that you like Twitter. Everyone does." Naturally, I tweeted that.



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## 68.STARBUCKS

**B 1971** Starbucks Coffee opens in Seattle's Pike Place Market on March 30.

Since Chief Executive Officer Howard Schultz bought Starbucks with a group of investors in 1987, the company has expanded from six stores to more than 21,000 in 65 countries.

—Haley Geffen

**What is your passion?**

My family and Starbucks, in that order.

**As a young person, was there any indication that you'd change the world?**

Growing up in Brooklyn, we spent most of our day in the schoolyard. I learned at a very early age that winning was important. My reputation was not as the best athlete out there, but I was always diving for balls on concrete. The heart I had and the will to win was a defining factor in how I played the game.

**You didn't start Starbucks, but you got involved very early on.**

I came to Seattle on business, and I walked into the Pike Place store and just felt like, God, this is me. I convinced the founder of Starbucks to hire me, and in 1982 my wife and I and our golden retriever drove 3,000 miles from New York. Starbucks had three stores at the time. That's how it all started. I bought the company in 1987 for \$3.8 million.

**What was life like before Starbucks?**

In the '70s, people were drinking instant coffee, Maxwell House, Yuban, and perking it at home. It wasn't very good. That's what Americans knew, and we had to introduce them to a whole new beverage. When Starbucks first started opening stores, many were convinced our coffee was too strong. We had to educate the market and the customer about this: "No, this is the way coffee should taste."

**What was the first cup of Starbucks coffee you ever had?**

It was in the Pike Place store in 1979. A French press of Sumatra. It changed my life. I still have a French press three or four times a day.

**What was the moment you realized that Starbucks was, you know, Starbucks?**

We opened our first store outside of North America, in Japan, in 1996. I really thought we might fail there. On the morning of the opening, people were lined up outside. A guy had slept there overnight; he didn't speak any English. We rushed him to the front of the line, and he said to the barista, in English, "Double tall latte." I knew then we were going to be a huge success.

**What was the turning point?**

In 1983, a year after I joined the company, I went to Italy for the first time. You can't walk through a town in Italy without running into a coffee bar and seeing the sense of community and the romance and theater around espresso. We were selling coffee beans, and it made me realize that the real business opportunity was creating a destination and a sense of community in the store.

I felt in my bones that what I experienced in Italy was something that was transferable to the U.S. I didn't at that point think that Starbucks would one day become part of the culture, the zeitgeist. But very early on, as we started opening up stores, there was something quite dynamic taking place.





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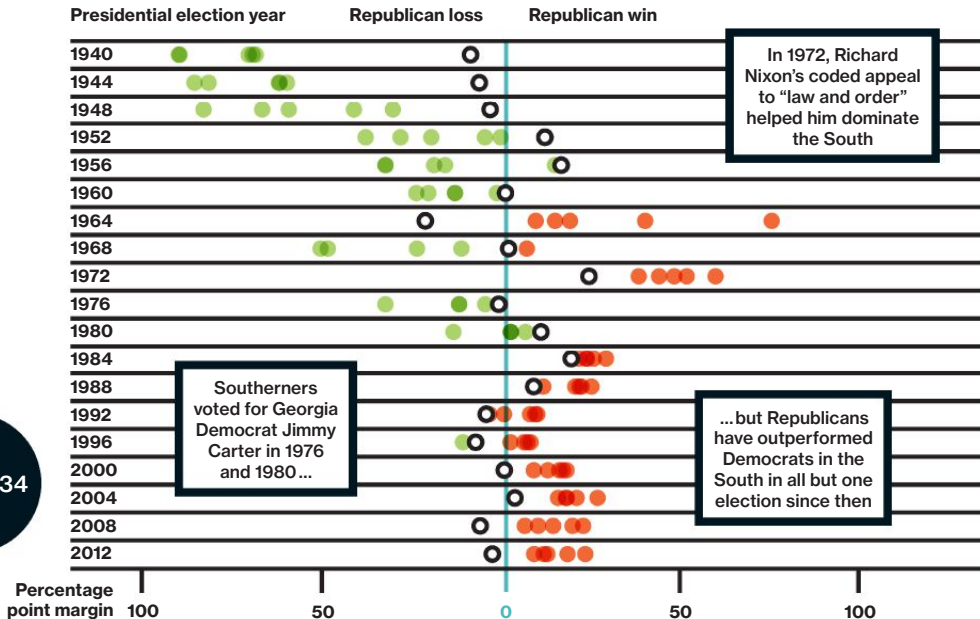


# 67. Southern Strategy

**P 1964** Five Southern states give their electoral votes to Barry Goldwater, the start of the Republican takeover of the Deep South.

## HOW THE SOUTH\* WAS WON

● State vote below national margin ○ National margin of GOP victory or loss ● State vote above national margin



\*ALABAMA, GEORGIA, LOUISIANA, MISSISSIPPI, AND SOUTH CAROLINA SOURCE: DAVE LEIP'S U.S. PRESIDENTIAL ELECTIONS ATLAS

When Lyndon Johnson signed the 1964 Civil Rights Act, he's said to have predicted, "There goes the South for a generation." He feared black suffrage would prompt white Southerners to abandon the Democratic Party. Under Richard Nixon, the GOP's "Southern Strategy" aimed to ensure it by systematically making veiled (and often not-so-veiled) racist appeals to white voters. "From now on," Nixon aide Kevin Phillips told him, "the Republicans are never going to get more than 10 to 20 percent of the Negro vote, and they don't need any more than that."

The Southern Strategy succeeded beyond what even Nixon could have imagined. It set off—or hastened—a political realignment in which the Democratic "Solid South" abandoned an attachment dating to the Civil War. In 1980, Ronald Reagan carried the entire South except for Jimmy Carter's home state of Georgia. In 1994 a gain of 19 House seats in the South enabled the Republican takeover of Congress.

Two generations later, the Deep South is reliably Republican. The last rural white Democrat in Congress, Representative John Barrow of Georgia, was defeated in the November midterms. In its right-wing politics, cultural outlook, and relationship with racial minorities, the Republican Party is thoroughly Southernized. This has alienated former Republican voters on the West Coast and in New England, an historical bastion of the Grand Old Party that's almost as bereft of congressional Republicans as the South is of Democrats.

The Southern stronghold has given Republicans a virtual lock on the House. But in presidential elections, America's changing demographic profile has turned Nixon's prize into a poisoned chalice. The 2016 Republican nominee is certain to carry the South. The party's fortune will hinge on whether that candidate can succeed anywhere else. —Joshua Green

FROM TOP: COURTESY MISTEREPIKANN/YOUTUBE; LAUREN BURKE/GETTY IMAGES

# 66.



# 65.

**M 2005** YouTube co-founder Jawed Karim uploads video No. 1—an 18-second clip of his visit to the San Diego Zoo.

Class clowns, wanna-be guitar heroes, freedom fighters, and adorable animals all gained a new outlet with the debut of YouTube. It wasn't the first video-sharing site, but thanks in part to the pedigree of its founders—the three hailed from PayPal—it soon dominated. Google acquired YouTube in 2006 for \$1.65 billion. More than 100 hours of videos are uploaded onto the site every minute. Nowadays, about 80 percent of YouTube's traffic comes from outside the U.S. An analysis of the top 10 videos by country revealed a surprising degree of overlap, suggesting a potential Ph.D. dissertation topic: Are countries that laugh at the same schlocky comedy skits less likely to wage war on one another? —*Cristina Lindblad*

**How Animals Eat Their Food** by MisterEpicMann was the No. 3 most watched video on YouTube in 2013

**Views to date:** 109 million

**Country rank in 2013:** Australia (1), Austria (3), Canada (3), Denmark (1), Finland (5), Germany (2), Hungary (6), Ireland (4), Netherlands (5), New Zealand (1), Norway (3), Sweden (1), Switzerland (3), U.K. (1), U.S. (3)



# YouTube

## COMMERCIAL INFANT FORMULA

**S 1959** Mead Johnson develops Enfamil, the first infant formula cheap and easy enough for widespread use.

Worldwide sales of infant formula, 2013

**\$39,716,100,000**

Fastest-growing markets from 2000 to 2013

Hong Kong	2,278%
China	1,648%
Kazakhstan	1,192%
Saudi Arabia	1,187%
Brazil	881%
Russia	777%
Turkey	669%
Iran	638%
Serbia	600%
Indonesia	597%

Biggest markets (all brands)



DATA: EUROMONITOR



## 64. THE SUPER BOWL

**M 1967** Sixty-five million Americans tune in to Super Bowl I—at the time the most ever for a sporting event.

With an audience of 111.5 million viewers, the 2014 Super Bowl was the most watched TV show in U.S. history. As the number of at-home spectators soars, so too have the rates advertisers pay to reach them: A 30-second spot in 2014 went for \$4 million. Here's a couch potato's guide to what after-game polls have deemed the most memorable Super Bowl commercials. —*Cristina Lindblad*

## NOT-TO-BE SKIPPED ADS

Two years after its Budweiser frogs were a hit during the 1995 Super Bowl, Budweiser hired Goodby Silverstein & Partners to kill off the amphibians. "We settled on lizards," says agency co-founder Jeff Goodby. "They would be like *Goodfellas*-type characters. Jersey guys. So we cast the thing, and it sounded like these guys were really going to kill the frogs. It wasn't funny, it was scary! So we went, 'Oh s---, it's not funny!'"

**Xerox's monks, 1976**

Apple's board balked at the Ridley Scott-directed "1984" spot, but it spurred strong initial sales of the first Macintosh computer, even though it aired only once.

Betty  
White for  
Snickers,  
2010

**"Mean" Joe Greene  
for Coke, 1979**

ETrade's creepy yet mesmerizing talking baby made his debut during the 2008 Super Bowl, kicking off a seven-year run.



Pepsi enlisted supermodel Cindy Crawford in 1992 to herald its redesigned can.

With such memorable lines as "When I grow up I want to claw my way up to middle management," a 1999 spot put online job search board Monster.com on the map.

A 1984 ad from Wendy's immortalized the phrase "Where's the beef?" The tag line worked its way into the Democratic primary pitting Walter Mondale vs. Gary Hart.

Reebok's 2003 ad featured "office linebacker" Terry Tate, who terrorized the residents of a cubicle farm.

Joe Namath and Farrah Fawcett for Noxzema, 1973

Old Spice's "Smell Like a Man" campaign made its debut during the 2010 game, creating buzz for a brand that seemed washed up.

Tabasco's exploding mosquito, 1998

A 2011 Volkswagen ad featuring a pint-size Darth Vader was shared a record 5.2 million times on social media.

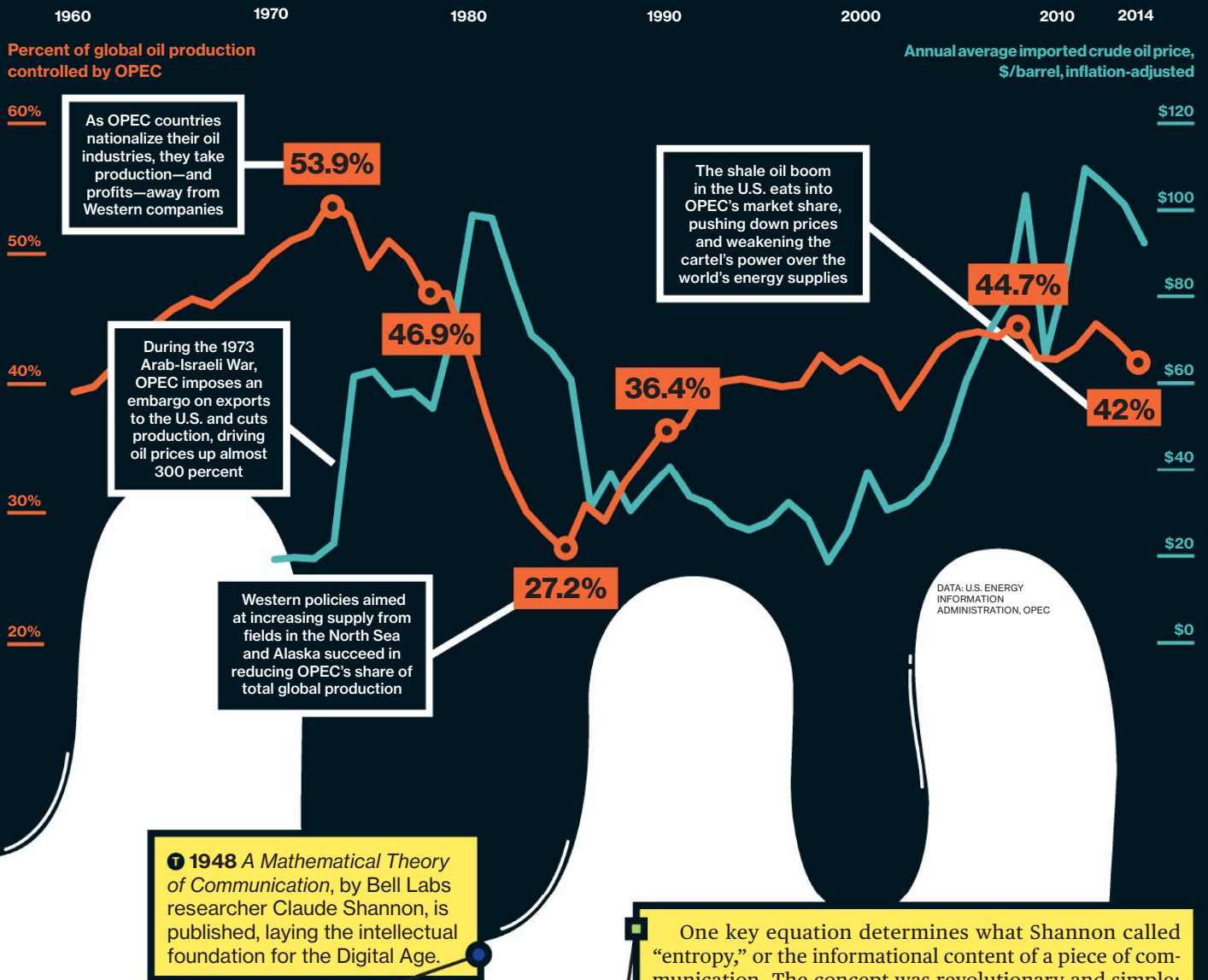
EDS cat herders, 2000

Doritos time machine, 2014



# 63.OPEC

📅 **1960** Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela establish the Organization of the Petroleum Exporting Countries, a cartel designed to exert control over global oil prices—and reduce Western influence in the Middle East.



📅 **1948** *A Mathematical Theory of Communication*, by Bell Labs researcher Claude Shannon, is published, laying the intellectual foundation for the Digital Age.

## 62. INFORMATION THEORY

Shannon's paper transformed information from a general term to a measurable, calculable quantity. Computers, which are machines for manipulating information, would have been impossible to program without Shannon's work—it was the first to apply the “bit” to circuit design. Information theory would prove vital for everything from cryptography to statistical modeling of the weather or the stock market, from spam filters and computer animation to speech-recognition software.

One key equation determines what Shannon called “entropy,” or the informational content of a piece of communication. The concept was revolutionary and simple: The informational value of a message, whether it's spoken, written, or encoded in silicon, is a function of how much the recipient already knows. If an outcome is highly unpredictable, a message communicating the outcome carries more information (and requires more bits) than if the outcome is more predictable (e.g., learning that a two-headed coin is going to come up heads). Shannon's entropy allows programmers to create software that packs the most important information into the smallest file size.

Imagine two selfies on your iPhone. One is of you on a white background; the other is you in front of a beautiful tapestry. In Shannon terms, the latter will have a lot more to convey, and his theory allows programmers to figure out how to communicate it at once accurately and efficiently. —Drake Bennett



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# 61. The Sharing Eco



40

1 1995 EBay creates a global market for everyone's old crap.

The world's first online bazaar, EBay gave people a way to sell their worn clothes and family heirlooms. Craig Newmark expanded on it the following year, when his e-mailed buy-and-sell newsletter

became the website Craigslist. Then more entrepreneurs riffed on the idea. Elance, founded in 1999, let professionals sell their skills. Etsy (2005) gave artists a hub for their homemade designs. Suddenly people were parceling out time and resources in all sorts

of ways. Airbnb (2008) let homeowners quickly rent to strangers; Uber (2009), Lyft, Zipcar, and many others made buying a ride a cinch. In the smartphone era, it became easy to exchange assets on the go. Finally, Silicon Valley gave the whole thing a name: the sharing

# onomy

**\$75 per hour**  
for your board-  
room in London's  
Euston Square

on  
**Zipcube**, where  
people traffic  
in office space,  
down to the desk

**\$0**  
Try a book  
on civics, you  
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monster

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which indexes  
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service that pretty  
much sums up  
America

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hour**  
to assemble  
furniture for hapless  
San Franciscans

on  
**Doughbies**,  
because  
cookies!!!

**\$12**  
for six fresh-  
from-the-oven  
treats delivered to  
your office in San  
Francisco

economy. There isn't a ton of sharing in the traditional sense, but with venture capital flooding the industry, there are few resources you can't find on one of these sites. Uber's runaway growth and \$40 billion valuation shows that the opportunity for new companies is real. As you can see, some other sharing-economy ideas seem like more of a stretch. —Brad Stone

■ **1973** Fischer Black, Myron Scholes, and Robert Merton publish papers on the Black-Scholes formula for valuing options.

By Robert Merton

I bought my first share of stock when I was 10 years old. I came from an academic family. There wasn't much money. Where I went to trade, they kind of adopted me, because I was a kid. That's when I first learned about convertible bonds. I would trade at 6:30 a.m. at Caltech. I traded over-the-counter options, especially warrants, and convertible bonds, even though I didn't know what I was doing. I went to MIT for grad school. I did a joint paper with Paul Samuelson on warrant pricing. That dealt with the option pricing problem, but we didn't quite crack it.

At MIT, Scholes and Black were working, and I was working. We were in a rivalry. As Myron said, "We don't tell Merton everything, because he's a competitor." Who gets it right wins, period. At the same time, it's cooperative. You all have an interest in figuring out how it works. That's a tension that always exists within research. It was a healthy competition, one of mutual respect.

Scholes's and Black's insight, which was a critical insight, was that hedging an option removes its systematic risk. At first I said, "That's impossible." But I looked into it. I went back to them and said, "You guys are absolutely right, but for the wrong reason."

The hedge removes *all* risk. There are two derivations of the formula: theirs and mine. They were nice enough to include mine in their paper. They put in a single footnote that said basically, "Bob Merton gave this to us." Black, to the end of his life, thought their solution was more elegant. But the replication system, the one I came up with, has caught on. Later I named the model the Black-Scholes model, in an appendix to a Samuelson paper. It seems a little pretentious to name something in your own name.

An option is essentially financial insurance. It's the right but not the obligation to take some kind of action in the future, like to buy or sell an asset. Holding an option can be very valuable. The theory describes not just the price of an option but what a low-cost intermediary or institution could manufacture the options for. It's kind of a production theory for finance instruments. I can come up with a completely new instrument and calculate what it should be worth. That had an important effect on the speed of innovation. Black-Scholes filled a need. In the 1970s we had stagflation; we had Bretton Woods coming apart, currencies bouncing around, OPEC. It was, "Oh, my God!" The stock market fell 50 percent in real [inflation-adjusted] terms in 18 months.

In the old options market, dealers ran ads in the newspaper with teasers, with posted prices for something that should change value by the minute. Can you imagine posting prices in the newspaper? It's just bizarre. There were the damndest kinds of things being used to price options—cube-root rules and stuff that came out of thin air.

Within months they all adopted our model. All the students we produced at MIT, I couldn't keep them in-house; they were getting hired by Wall Street. Texas Instruments created a specialized calculator with the formula in it for people in the pits. Scholes asked if we could get royalties. They said, "No." Then he asked if we could get a free one, and they said, "No."

Now the formula is used everywhere. If you have a mortgage, your right to prepay is an option. Your right to default and turn over the house to the lender if it's underwater is an option. Every simple mortgage has these two options embedded in it. Seven hundred trillion dollars of this stuff is sloshing around the earth.

People say, "Imagine if you got a penny every time somebody used the Black-Scholes formula." In every way we did better by putting it in the public domain, which is what we planned to do anyway. Had it not been in the public domain, it might never have been adopted. —As told to Peter Coy

$$C(S, t) = N(d_1)S - N(d_2)Ke^{-r(T-t)}$$

$$d_1 = \frac{1}{\sigma\sqrt{T-t}} \left[ \ln\left(\frac{S}{K}\right) + \left(r + \frac{\sigma^2}{2}\right)(T-t) \right]$$

$$d_2 = \frac{1}{\sigma\sqrt{T-t}} \left[ \ln\left(\frac{S}{K}\right) + \left(r + \frac{\sigma^2}{2}\right)(T-t) \right]$$

It would take  
the whole  
magazine  
to explain  
this formula

# BLACK-SCHOLES



## 59.CABLE NEWS

**M** 1980 Cable News Network, the first 24-hour news channel, makes its debut.

David Walker and Lois Hart anchored CNN's first newscast on June 1, 1980. The couple later were among the original anchors at CNBC. —*Brandon Lisy*

### How did you come to work at CNN?

**Walker:** I was working at the ABC affiliate in Sacramento, and there was a little pink call slip on my desk, and it said Sam Zelman, CNN. He was running around the country trying to find experienced newspeople for CNN. He explained that CNN was going to be a 24/7 news operation going on the air around June of next year, and would I be interested? And I said yeah, sure. I also mentioned that my wife is a newscaster and reporter. He said why don't you both come on out and we'll do an interview, which we did.

### What was your impression of Ted Turner?

**Walker:** We had an open newsroom studio at that time, and he had an office and a little bedroom upstairs he would sometimes stay in. He would come down early in the mornings with his little Dixie cup and in his bathrobe, and he would chew tobacco at that time of the morning. He left the news operation and the news side to the newspeople, and he funneled all the money in to support it.

### Was there any trepidation about whether a 24-hour news channel would work?

**Hart:** Ted Turner had a reputation as a maverick, and so that was exciting. It was an adventure, and we were young and we don't have kids, and it seemed like something that would be interesting, a lark, perhaps.

**Walker:** The notion then was, can we actually fill 24 hours a day with news? There was kind of fear and trepidation among the executives in particular at that time. It turned out not to be the case. We had plenty of material, because they had set up an affiliate network with stations all across the country at the time. So we're receiving lots of news reports. A lot of them, frankly, weren't all that interesting, but they did fill the time.

### Let's go to the first day of CNN.

**Walker:** We found out we were going to be the anchors of that newscast about, what, three or four days before? And it was kind of like, wow, you've got to swallow hard. You also realize it's a lot of weight to carry. The lights on the camera came on, and I said, "I'm David Walker," and she says, "I'm Lois Hart."

**Hart:** With no formality and no speeches, we just began the newscast. It was a harried news day, lots of breaking news, lots of satellites, lots of covering up for problems. We were both very nervous, and I'm told that we looked very calm, so that's good. Everybody was very nervous, and I guess it went all right, and off we went. And I think I closed the newscast by saying it would go forever, and I hope that's true.

Photograph by David Brandon Geeting

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# 58. THE INNOVATOR'S DILEMMA

**B** 1997 *The Innovator's Dilemma*, a book about why well-managed companies often fail, coins a soon-to-be ubiquitous term: "disruptive innovation."

By Clayton Christensen

I decided to study the disk-drive industry on a tip from one of my faculty members, who said he knew nothing except that successful disk-drive companies had failed over and over again. They were the fruit flies of business: It's a very fast cycle time, so it's a great thing to study. At the time, I was living essentially in the Motel 6 on First Street in San Jose. It was about 7 o'clock one night, and I had gone across the street to have dinner at McDonald's. And I was going back to Motel 6, and in the middle of the street it just fell into place—and I realized why the low end wins so frequently.

This phenomenon that I call disruption is one that allows a larger population, people who historically didn't have enough money to buy a product, to afford something like it. That creates growth. The puzzle was, if this is what creates growth, why don't the leaders in the industry go after it? I realized that every company has a business model, and they can invest in things that help them make money in the way their business model is structured. If innovation doesn't allow them to make more money in the way they're structured to make money, they can't do it. So that was the big idea. It had nothing to do with technological change. Once I had that, I could see it happen everywhere. That was the real epiphany.

One of the insights we got early on is that the leader in an industry actually can catch disruptions and succeed at them, but they have to set up a completely different business model. It can be a different business model underneath the corporation's umbrella. And if you set it up separately, then you can

succeed quite well. We issued a second edition of *The Innovator's Dilemma* and published this insight as a new chapter. Subsequent to that, I haven't found a single anomaly to that observation.

In reality, the vast majority of people who use the word "disruptive" have never read anything that I've written. They use it to justify whatever they want to do in the first place. I wish I knew how to control the use of the idea, but it turns out that it's not just me.

In terms of the most disruptive ideas of the last century, terrorism is disruptive relative to the way we have historically tried to defend ourselves. It enables a new population of people with less money and less skill to create chaos in the world. Their business model is very different than the business model of the Department of Defense. The computer and car are also disruptive. Every generation of computer, from mainframe to PCs to smartphones, was disruptive; in each generation, the leader got killed by new companies that made computing more affordable and accessible. Cars were toys to the rich until Henry Ford made the car accessible so millions of people had access to it. Then Toyota did it again when they came into America in the '60s with their Corona—they made cars so affordable that the rebar of humanity, college students, could own one.

On the other hand, the electric car is not in any way disruptive. I don't think Tesla itself thinks this way, but there are a lot of investors who do. It's what I call a "sustaining innovation"; it makes a good product better. It's up against the very high-end cars made by BMW and other sports cars. A disruptive innovation in electric cars, you can see coming from the bottom—from the world of golf carts. They just get better and better and better. You see them now; you see them everywhere. Ten years ago, you didn't see them. That's disruptive.

—As told to Brad Wieners

**W** 1973 Engineer Jack Nilles coins the terms "telecommute" and "telework" to describe the new idea of working remotely.

Conceived by a University of Southern California researcher in 1973, the same year an oil embargo sent gasoline prices soaring, telecommuting went mainstream with the '90s-era rise of

PCs and home Internet connections. Today, roughly 3.5 million American employees work from home at least half the week, according to Global Workplace Analytics. A life-changing tool for many, it's also sometimes used as a high-tech method of phoning it in. When Marissa Mayer became CEO of Yahoo! in 2012, one of her first orders of business was to get slacking teleworkers back into the office. —Caroline Winter

# 57. Telework



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The U.S.  
is the world's  
No. 1 consumer  
of bottled water

## 56. BOTTLED WATER

1977 Perrier launches a \$5 million marketing campaign in the U.S.

Cost of 1 liter  
of Smartwater  
**\$1.18**

The first bottled water in America can be traced back to the 18th century; by 1872, the company Saratoga Spring was selling millions of bottles annually. But the product as we know it didn't gain popularity until the late 1970s, when the French brand Perrier started airing U.S. TV commercials. By 1979, sales of Perrier had jumped 3,000 percent. Now there are hundreds of international bottled water brands; Glacéau Smartwater, which is owned by Coca-Cola, is the bestseller in the U.S.

—Emma Rosenblum

U.S. retail sales of  
bottled water in 2013  
**\$37.3b**

**7.9b**  
Gallons of bottled  
water consumed  
in the U.S. in 2013

Cost of 1 liter  
of municipal water\*  
**\$0.005**



# 54.S



1984 Donna Karan creates Seven Easy Pieces, a mix-and-match wardrobe that allowed women to look professional and feminine at work.

By Donna Karan

When I was working at Anne Klein in the '70s, women were wearing jackets and bow ties and shirts—more or less dressing like men. Where was the sensuality of women? Nobody was doing the kind of clothes women needed from the minute

## 55. SECURITIZATION

1970

Ginnie Mae bundles mortgages together into Pool No. 1 and sells shares of it to investors.

The idea of bundling up loans and selling them to investors was supposed to make credit cheaper and less risky. Lenders could offload debts into the private market, freeing up capital to fund new loans. Meanwhile, investors would get payments from thousands of borrowers, spreading the risk.

It worked well for decades. In 1970, Ginnie Mae Pool No. 1 laid the groundwork for bundling mortgages. Fifteen years later, investors for the first time could own "slices" of other kinds of loans, starting with computer leases. Wall Street eventually found ways to pool all kinds of expected payments—loans to buy a used SUV or attend culinary school, TV rights for *Gladiator* or *Shrek*, royalties for drug patents and David Bowie's songs, and franchise fees for Carl's Jr. and Hooters.

But nothing drove the market, and the economy, more than mortgages. Securitization made credit cheaper and easier to gain access to—which also made it easier for consumers to load up on more and more debt. "I frequently think we did a very bad job in an honest attempt to do good," mortgage bond pioneer Lewis Ranieri told Bloomberg News in 1999.

In the new millennium, securitization took on a life of its own. Issuance of asset-backed securities grew from less than \$540 billion in 2000 to a peak of more than \$2.4 trillion in 2006. The securities themselves were bundled up and sliced into pieces yet again—into collateralized debt obligations, creating one more layer between borrowers and the investors who bore the risk. As investors clamored for higher returns, lenders offered ever more exotic loans with hasty underwriting. America fell too deep in debt, the bubble burst, and the Great Recession began.

New rules passed after the financial crisis aim to force lenders who sell the loans to have some stake in how they perform in the future. The regulations haven't all been enacted, leaving it uncertain whether the securitization markets can be trusted to flourish safely. —Karen Weise



# portswear



Karan (center top) with models wearing her DKNY collection in 1989

they got up in the morning to the minute they went to bed at night. I don't think anyone really understood how crazy our lives were. Those suits were holding us back. We wanted to move. We wanted to be comfortable. Think of, say, a black dress in a stretch fabric. You can wear that to work, and then you can go out at night—there's nothing better than a jersey dress. It holds us in and lets us breathe.

I was a yogi, and I always wore a bodysuit and a pair of leggings, and this wraparound skirt thing. It was the

inspiration behind the group of garments—the bodysuit and tights, skirt or pants, a body blouse, a tailored blazer, a cashmere coat, and an evening piece—that would become my first collection, *Seven Easy Pieces*.

Sportswear, this idea of more relaxed separates that you can put together to create an outfit, had existed since the 1930s or '40s, but it was for casual wear. In the '80s, fashion was either the boxy man's suit or all about ladies who lunched. Forget about ladies who worked! As a

working woman and a mother, I was constantly having to dress for my job and then go out at night. And the only thing I was really changing was my shoes. Or adding a piece of jewelry or a scarf, giving that little twist to the outfit. That's what I love about clothes—to have that flexibility—but I never thought my idea would catch on.

People eventually took to it. And every woman wants to wear yoga pants now. Woo! Who would have thought? —As told to Kurt Soller



# 53.PowerPoint

W 1987 Forethought, a California software company, releases an application for making spiffy presentations.

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- Created by Dennis Austin, Robert Gaskins, Tom Rudkin
- Cost: \$395
- Made 35mm slides and 8 x 10-inch transparencies
- Mac only

## The Microsoft Era

💡 **Bill Gates** bought it for \$14 million

- 💡 Packaged into **MS Office** in 1990
- 💡 Pretty soon its bullet points were in every **meeting, lecture, and gathering** imaginable

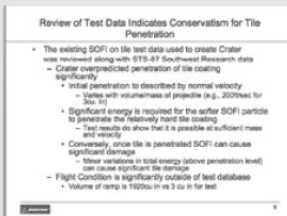
## Global slideshow domination



### Market Share

- 🌐 PowerPoint
- 🟡 Not PowerPoint

*But:* PowerPoint design is often deeply bad, and its look of authority can mask terrible thinking



*Some blame this text-heavy NASA slide for the 2003 Columbia shuttle disaster*

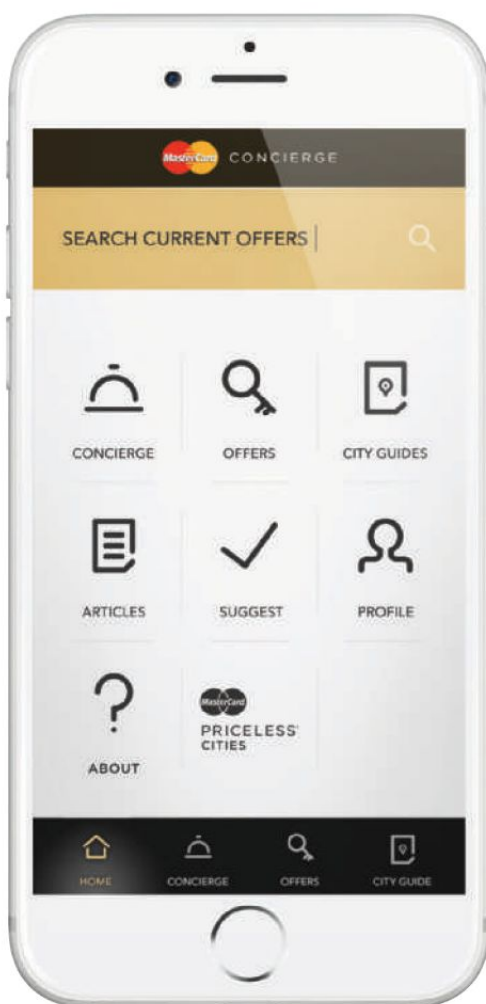


*The NSA never thought these blithe slides about spying would become public*



# Questions?

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# 52.The Poverty Lab

📌 **2003** Three MIT economists—Esther Duflo, Abhijit Banerjee, and Sendhil Mullainathan—establish the Poverty Action Lab, which helps pioneer the use of randomized trials to study poverty.

By Esther Duflo

There are various ways to define poverty. One definition of extreme poverty is living with a per-day budget of \$1 in real terms. That's very convenient in that it can help track the world's progress and decide which regions might need the most aid. But it's also incomplete. Poverty is not just a lack of income but a lack of access to proper education, good health, and the ability to realize yourself according to your talents.

There is no big answer to the big question of what to do about this. The only questions you can ask and answer conceptually are whether a particular program or policy is effective, and whether there's a way to make it more effective.

In a clinical drug trial, you take a population of people, randomly select half of them, and give them a new drug. The other half gets the standard drug or the placebo. Because of randomization, you can get a good answer on the effectiveness of your drug.

You can do almost the same thing for any social problem. One of my favorite projects we've conducted is the immunization incentive project, because the effects were so much larger than we expected, and because it deals with such an important question. —As told to Mark Littman

## IMMUNIZATION INCENTIVE PROJECT

### The Problem

Child immunization rates among villagers in Udaipur, India, are low.

### The Question

Will more people immunize their children if they are given incentives to do so?

### The Experiment

Working with a local nongovernmental organization, Duflo's team set up camps across Udaipur offering free immunizations. In some camps, people were also given a 1-kilogram bag of lentils when they brought their children in. Duflo compared immunization rates in areas where these camps were set up with the rates in areas where immunizations were available at government-run clinics.

### The Results

Immunization rates at government-run clinics: **6%**

Immunization rates at camps: **17%**

Immunization rates at camps + lentils: **38%**

The cost per immunization at camps where people received lentils was \$27. The cost at the other camps was \$50.

### Conclusion

"That difference is really, really enormous. It turns out to be cheaper to give the lentils than not to give the lentils."

# 51.FACEBOOK

Monthly active users

Average "Likes" per day

Number of messages sent since January 2012

Number of friend connections

Number of shared photos

📌 **2004** Mark Zuckerberg and Harvard classmates launch a social networking site.

As its membership has grown to one-sixth the size of the world's population, Facebook has had to buy up massive amounts of computing hardware to keep delivering baby pictures and BuzzFeed quizzes. Along the way, it's helped revolutionize how Internet companies process data. Facebook engineers have created specialized software that can unify tens of thousands of cheap servers and developed designs for heat-resistant hardware that can get by without much air conditioning. Spare a thought for the mind-boggling scope of the operation the next time you click "Like." —Ashlee Vance

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Since 2003, employee out-of-pocket expenses have risen nearly 90 percent<sup>1</sup>.

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# 50. TEENAGE CONSUMERS

§ 1941 *Popular Science* prints a new word—"teen-ager"—in a sentence claiming they "never knew teen-agers could be so serious."

## TEEN STYLE, 1940-PRESENT

1944 Girls were called "bobby soxers" and obsessed over Frank Sinatra; 20,000 of them mobbed Times Square for one October concert.

1959 Teens spent \$10 billion annually, not including purchases made for them by their parents. Boys wanted to look like James Dean.

1976 A survey from the time indicated that 1 in every 12 teenagers used pot on a daily basis. *Saturday Night Fever* brought disco mainstream.

The word was quickly ushered into the cultural lexicon: *Life* magazine wrote about the "new importance" of teenage girls in 1944. A year later, the *New York Times Magazine* published the Teen-Age Bill of Rights, including, naturally, "the right to have fun."

The ascent of the teenager acknowledged that adolescents, as they were formally known, were a distinct social group that could be easily marketed to. The soda company 7 Up was among the first to do so, referring to itself in a '50s print ad as the "cool pet of the teen set." That same decade, the average American teen earned more in weekly allowance than some families took home in a week during the Depression, giving youth increased spending power. Here, a showcase of their changing consumer habits.

—Julie Ma

1965 Girls age 13-19 bought 25 percent of all cosmetics. Fifty-three percent of movie tickets and 43 percent of records were bought by teens.







2000 Nokia's tiny phone sold more than 160 million units and introduced high schoolers to a game called Snake. Nokia's annual sales: \$25 billion.

2014 In one survey, 46 percent of teens say their next headphones will be from Beats by Dr. Dre. Apple acquired the company for \$3 billion.

1985 The boombox became a status symbol for young urbanites, thanks in part to LL Cool J's Radio album cover.

1994 Teens adopted Dr. Martens, and annual sales jumped to \$269 million. By 1999, Timberland became the top boot of hip-hoppers and did almost \$1 billion in sales annually.

Photograph by David Brandon Geeting

STYLING BY SHIBON KENNEDY / PROP STYLING BY PRISCILLA JEONG, HAIR AND MAKEUP BY SILVIA CINCOTTA, CLOTHING FOR MODEL ON FAR RIGHT: GOP USA (HAT) MARK MCNARY (JACKET AND T-SHIRT) LIGHTNING BOLT U.S.A. (TROUSERS) NORSE PROJECTS (SHOES)



● **1999** Eleven European nations adopt the euro as their common currency. —*Brendan Greeley*

Every EU member is supposed to adopt the euro, but the U.K. and Denmark have exemptions in their treaties with the European Union that allow them to keep their national currencies, the pound and the krone.

This is a €1 coin. Some 110 trillion pieces of euro-denominated loose change are in circulation.

As with the 12 stars on the EU flag, the 12 stars on the euro don't represent countries but "the ideals of unity, solidarity, and harmony among the peoples of Europe."

To emphasize unity, the euro coin since 2007 has shown a borderless map of Europe—including countries such as Norway and Switzerland, which aren't even part of the European Union.

On Jan. 1, 2015, Lithuania will become the 19th country to enter the euro zone. Since the financial crisis began in 2007, Slovenia, Cyprus, Slovakia, Estonia, and Latvia have joined as well.

Sweden has also kept its currency, the krona. In 2003 voters decided to hold off adopting the euro. The country has since maintained that it doesn't meet the monetary or fiscal requirements to join the currency union.

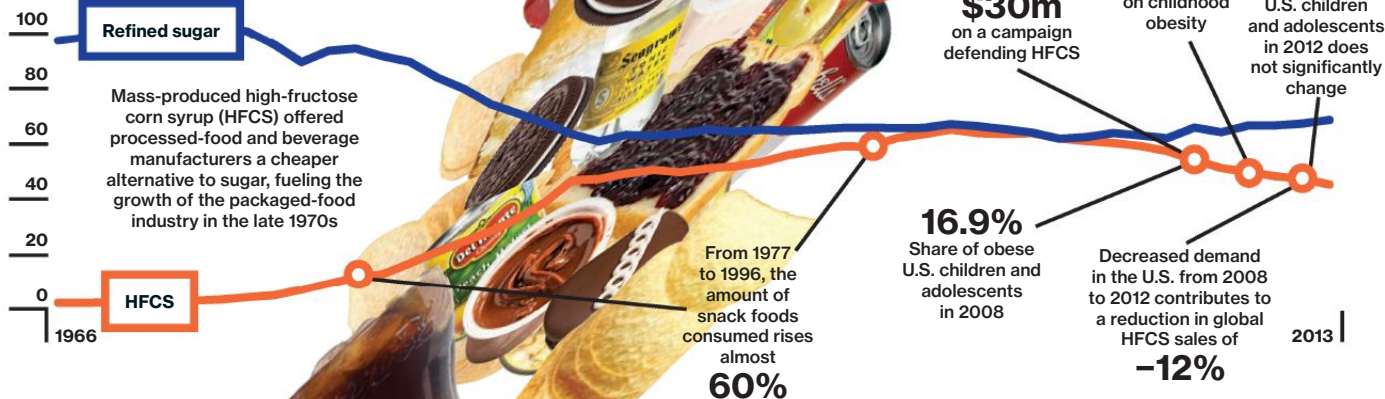
Unlike euro bank notes, which are printed by the European Central Bank, euro coins are minted by individual states. The obverse of every coin features a symbol of the state that minted it. The total number of coins in circulation reflects the relative size of each country's economy within the euro zone—which means there are more coins with German eagles in circulation than any other.

The least common euro coin is the one minted by the Ufficio Filatelico e Numismatico in Vatican City, which features the image of His Holiness Pope Francis on the obverse of a coin. Its rarity makes it worth more than its face value.

## 48. High-Fructose Corn Syrup

● **1957** Researchers Richard Marshall and Earl Kooi working at the Oklahoma Agricultural Experiment Station succeed in converting corn-derived glucose to fructose, which can be used as a food sweetener.

Estimated per capita U.S. deliveries of sweeteners in dry basis pounds



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**From:** Intel CEO Paul Otellini  
**To:** Colleague

**Date:** 2006

**“The best friend money can buy.”**

Otellini was referring to Dell founder Michael Dell after the computer maker nixed plans to buy chips from Intel rival Advanced Micro Devices. In 2009 the state of New York accused Intel of bullying customers into using its chips and paying them not to switch to AMD.

**Cost:** Intel settled the case in 2012 for \$6.5 million, without admitting wrongdoing.

**From:** SAP executive Léo Apotheker  
**To:** Colleague Bill McDermott

**Date:** 2005

**“We need to inflict some pain on Oracle.”**

In 2005, SAP acquired a company that provided tech support to Oracle customers and downloaded its software and manuals without paying for them. Oracle sued in 2007, alleging that SAP stole its trade secrets.

**Cost:** In 2014, SAP agreed to pay \$357 million in damages to settle.

**From:** Apple CEO Steve Jobs  
**To:** Palm CEO Ed Colligan

**Date:** 2007

**“We must do whatever we can to stop this.”**

This line was part of an e-mail exchange among Apple, Google, Palm, Intel, and Adobe as they negotiated a moratorium on poaching one another's employees. In 2014 the damning e-mails helped lead the companies to try to settle charges of conspiracy to hold down worker wages.

**Cost:** Pending. Federal Judge Lucy Koh struck down the preliminary \$324 million settlement as too stingy.

**From:** BP engineer Brian Morel  
**To:** Colleague Richard Miller

**Date:** 2010

**“This has been a nightmare well which has everyone all over the place.”**

This e-mail was sent six days before the explosion of the Deepwater Horizon oil platform off the coast of Louisiana, showing operator BP could have done more to prevent the disaster.

**Cost:** It was among several messages that helped persuade the company to enter into an ongoing settlement topping \$28 billion.

W 1976 In *Williams v. Saxbe*, a U.S. District Court rules that quid pro quo sexual harassment constitutes sex discrimination.

In 1975, a trio of feminist activists in the Human Affairs program at Cornell University wrote a letter describing a painful and familiar story. A

mother of two named Carmita Wood had come to them for help. She had left her job of eight years after enduring long-term stalking and molestation by her male boss and was then denied unemployment benefits because she had quit her job “without good cause.” The Cornell women

wanted to help her, and they debated different ways to describe what Wood had suffered—a debasement that threatened her economic survival. “Sexual coercion,” “sexual intimidation,” and “sexual blackmail” were all considered, but none had the right ring of seriousness without melodrama. Then it came to them: “sexual harassment.” They coined the term in a letter sent out seeking a lawyer to take the case. Finally, something that had been going on for as long as women had worked alongside men—the abuse of female employees by male

**From:** Merrill Lynch analyst Henry Blodget **Date:** 2000  
**To:** Colleague Eve Glatt

"I can't believe what a POS [piece of s---] that thing is. Shame on me/us for giving them any benefit of the doubt."

Blodget was talking about Lifeminders, one of the many dot-com bubble startups that he publicly promoted. An SEC investigation later found he was deriding the companies in private.

**Cost:** Blodget paid about \$4 million and was banned from the securities industry. He went on to found news site *Business Insider*.

**From:** Microsoft Windows head Jim Allchin  
**To:** Chairman Bill Gates, CEO Steve Ballmer

**Date:** 2004

"I would buy a Mac today if I was not working at Microsoft."

This e-mail came to light in December 2006, during a Microsoft consumer anti-trust trial in Iowa.

**Cost:** Allchin, already on his way out, stepped down a month later. (Microsoft eventually settled with the state and didn't disclose terms.)

1971 A computer engineer in Boston sends himself a test e-mail on Arpanet, the precursor to the Internet.

The ability to send messages long or short in an instant is liberating. It also doesn't leave much time for the kinds of second thoughts that occur while whiting out typos, sealing envelopes, affixing stamps, or walking to a mailbox. Here are some of the costliest moments in e-mail history. —Ashlee Vance

**From:** SAC Capital portfolio manager Mathew Martoma  
**To:** CEO Steven Cohen

**Date:** 2008

"Is there a good time to catch up with you this morning? It's important."

At the \$14 billion hedge fund SAC Capital, Martoma was warning his boss that they were about to lose millions on a trade.

**Cost:** This e-mail became part of the government's case against Martoma, who was convicted of insider trading and sentenced to nine years. Separately, SAC pleaded guilty and paid \$1.2 billion.

**From:** Scammers  
**To:** You

**Date:** Today

"My name is Danjuma Sule,

one of the sons of major Gen Gumel Danjuma Sule, The late Nigeria's former minister of mines and power in the regime of the late former Nigeria's military Head of state, Gen Sanni Abacha."

A typical Nigerian scam e-mail.

**Cost:** People around the globe lost \$9.3 billion to this kind of fraud in 2009, according to researcher Ultrascan.

bosses—had a name. And that meant it could be fought.

There were two breakthrough legal cases that established sexual harassment as a form of sex discrimination and a violation of a person's rights under the 1964 Civil Rights Act. The first was that of Diane Williams, an African American woman who was fired from her job as a public information specialist at the U.S. Justice Department after refusing the sexual advances of her boss. She sued in a Washington federal court and won.

Around the same time, the case of Paulette Barnes, also African American, who was hired as a payroll clerk at the U.S. Environmental Protection Agency, was making its way through the courts. Shortly after Barnes reported for work, her male supervisor started demanding sex, suggesting that she would benefit career-wise if she complied. She didn't—and was eventually fired. Barnes sued, lost, and ultimately won

on appeal in 1977, with the higher court finding that she had suffered a form of discrimination. A separate case brought the issue to the Supreme Court, which in 1986 recognized it as a civil rights violation.

For employers, the precedent created by Barnes's case—and later, the testimony of Anita Hill during the 1991 confirmation hearings of Supreme Court Justice Clarence Thomas—raised the legal and reputational costs of tolerating such behavior in the workplace. "Sexual harassment law is the first law written by women about our own condition," says Catharine MacKinnon, the pioneering lawyer who first developed a legal theory of sexual harassment. "Naming sexual harassment, and calling it what it is in law—a practice of sex discrimination—has given survivors then and now the sense they are not to blame and not alone, the dignity of a civil rights violation, and a forum for accountability and relief." —Sheelah Kolhatkar



# 45. Air Jordans

92%

Nike/Jordan brand share  
of the U.S. basketball shoe  
market in 2013

\$104,765

Price a collector paid in 2013 for a pair Jordan  
wore in the 1997 NBA Finals





# 1.5m

Pairs shipped in the  
first six weeks

© 1985 Nike introduces the Air Jordan basketball shoe—  
retail price: \$65.

In the summer of 1984, Michael Jordan's agent, David Falk, met with Nike executive Rob Strasser. Falk wanted a signature shoe called the Michael Jordan. Strasser said it needed a better name. "In the middle of this meeting, I had this brainstorm," Falk recalls. "Nike had just started coming out with running shoes that had this new Air technology. And because of the way Michael played... Like no product before or since, the Air Jordan reshaped the footwear industry. Basketball shoes became everyday wear; Nike, the runaway market leader. Thirty years later—with Jordan's last NBA game more than a decade behind him—his sneakers still dominate. In 2013 brand Jordan, which Nike made its own business unit in 1997, sold \$2.25 billion worth of shoes in the U.S., according to data from SportsOneSource. Michael's closest competitor, LeBron James, sold \$300 million. —*Ira Boudway*



## 44. Billable Hours

**W 1975** The Supreme Court rules in *Goldfarb v. Virginia State Bar* that “minimum-fee schedules” used to set lawyer rates violate federal antitrust law.

In the law business, no institution rivals the billable hour in the generation of large-firm partner wealth—or associate misery. The system of multiplying hours (allegedly) worked by a (dismayingly high) rate “rewards unproductive behavior, invites abuse, and pits attorneys’ financial self-interest against their clients’ goals,” says Steven Harper, a former partner at Chicago-based Kirkland & Ellis who now blogs at the Belly of the Beast.

For partners of large corporate firms, the billable hour functions like a cash printing press. That’s because of the magic of “leverage”: Partners employ armies of associates whom they compensate at levels far below the associates’ billable rates.

To survive at a typical big firm, a mid-level associate has to bill 2,000 hours a year. At a rate of \$500 an hour, that associate will generate \$1 million in revenue, while costing only \$250,000 in salary. To have any hope of one day making partner themselves, of course, more ambitious associates will try to bill 2,500 hours. That creates even more profit for the partners—but also the likelihood of associate burnout and disillusion and, in extreme cases, fraud.

So where’d this great idea come from? For much of the 1800s, legal fees were capped “per service” by state law, and litigation fees were paid by losing parties. Those state restrictions eroded by the late 19th century, freeing attorneys



*A young law firm associate appears before Saint Peter and asks why he’s being taken at the tender age of 27. Surprised, Saint Peter says: “Based on your billable hours, we thought you were 87.”*

to use a variety of billing methods: set fees for defined tasks, annual retainers, and “contingency fees,” which the American Bar Association deemed acceptable in 1908. By the 1940s, state bar associations led a return to standardized fees, but this time with published minimum rates. Through the ’60s, the ABA’s Model Ethical Code condemned as unethical any attorney who “undervalued” his services and thereby encouraged price competition. At the upper reaches of corporate practice, elite firms were using an “eyeball” method to charge their deep-pocketed clients flat amounts “for services rendered.”

A turning point came in 1975, when the Supreme Court ruled in *Goldfarb v. Virginia State Bar* that bar association minimum-fee schedules violated federal antitrust law. In so doing, the justices helped usher in the

era of the billable hour, which continues. In the ’70s and ’80s, a new cottage industry of law firm consultants urged their attorney clients to keep more accurate records and bill aggressively. Growing phalanxes of salaried associates helped maximize firms’ profits.

Since the 1990s, some corporate clients have periodically demanded alternative fee arrangements. In response, creative law firm partners have offered to do certain assignments for flat fees or on sliding scales. The 2008-09 recession forced many law firms to curb the inflation of billable rates and even offer discounts. But the billable hour persists for two main reasons: It gives clients some basis for auditing how they’re being billed, and it rewards richly those attorneys who find ways to keep the meter running. —Paul M. Barrett

## 43. NAPS STEER

**M 1999** Shawn Fanning, 19, launches a file-sharing service for music.

Napster wasn’t the first peer-to-peer computing system, but it was the first one people used in large numbers. Even aside from the promise of free music, the idea seemed radical to Ali Aydar, one of the company’s first employees. “Back then there was a distrust of the Internet in general,” he says. “The idea that you’d allow another person who you don’t know to connect to your computer and add things or take things from your hard drive was totally novel.”

Like most startups, Napster endured its share of technical challenges. The system was actually a series of smaller networks, where people only had access to songs on the drives of those in

their corner of Napster. The company struggled to connect everyone to a larger, central network.

Aydar says Napster planned to expand beyond music, but it never had the chance. The Recording Industry Association of America sued the company in December 1999 for copyright infringement. “We couldn’t make any changes to anything once the

lawsuit was filed,” Aydar says. A judge ordered the company to shut down in 2001. While successive attempts to relaunch the service never gained traction, Napster’s proposition—that music wants to be free—became the basis of music streaming services such as Spotify and Pandora and maimed traditional music sales forevermore. —Joshua Brustein

From  
1999 to 2011

5,384

U.S. record stores closed



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# 42. WORKPLACE SAFETY

**W 1970**

Richard Nixon signs legislation creating OSHA.

When a fire broke out in 1911 at the Triangle Shirtwaist Factory in New York, 146 workers died. Many jumped from windows because the doors that could have saved their lives were locked to stop them from stealing. In the ensuing century, workplaces have been transformed. Since Congress created the Occupational Safety and Health Administration in 1970, the U.S. workplace death rate has dropped 81 percent, saving half a million lives. Economic and technological changes have swept workers out of the most deadly jobs and into comparatively safer ones. New state and federal standards have outlawed corner-cutting that formerly killed employees, imposing costs on companies that don't comply. Still, deaths from workplace injuries in the U.S. averaged 13 a day in 2012, and the number of work-related deaths—counting illnesses such as lung cancer—may be 10 times as large. Work can be far more lethal in developing countries; witness the April 2013 collapse of a facility housing garment factories in Bangladesh, which killed eight times the number who died in the Triangle fire. In many parts of the world, workplace safety is an idea whose time is yet to come. —*Josh Eidelson*

## UNINTENTIONAL U.S. WORKPLACE DEATHS

per 100k people



SHARP DECLINE IN 1992 REFLECTS A CHANGE IN METHODOLOGY  
DATA: NATIONAL SAFETY COUNCIL

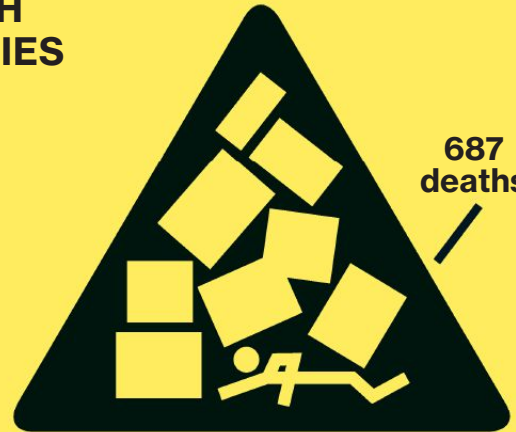
## INDUSTRIES WITH THE MOST FATALITIES IN 2013

479 deaths



Agriculture, forestry, fishing, and hunting

687 deaths



Transportation and warehousing

304 deaths



Manufacturing

Construction

796 deaths



408 deaths



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**BENTLEY**



# 41. ATARI

**M** 1972 Atari releases Pong.

Nolan Bushnell, a co-founder of Atari (and founder of Chuck E. Cheese's Pizza Time Theatre) pioneered the video game industry.

—Haley Geffen and  
Brandon Lisy

**Describe one of your early jobs, running the games at an amusement park.**

This was throwing balls at milk bottles, guessing ages and weights. And I turned into a carny, quite frankly. I was promoted to manager of the whole department. So, at 21 years old, 20 years old, I had 150 kids reporting to me. The first thing I started doing was redesigning some of the midway games so that they'd make more money. And they did make more money. I had the highest per-caps of any amusement park in the nation.

**Atari started out making games for arcades and bars. Why did you get into home systems?**

Bars and restaurants are one thing, but it was really very adult-oriented at that time. Kids couldn't go into bars. Bowling alleys were not really a kid-friendly environment. I felt that games were good for you and everybody needed to play. Home gaming allowed a much broader dissemination of electronic game playing into the population. Kids, adults, everybody.

**People say success is being in the right place at the right time. Do you believe that?**

We hit it just at the knee of the curve, where semiconductors became blindingly cheap. I believe that video games would've absolutely happened without me. The stuff we did was unique enough that maybe we accelerated it by five years. We ended up with an 85 percent market share of the coin-operated game business. And our only weapon was creativity.

**The "ball" in Pong—it was square, not round. That's because square was...**

Cheaper.

**Tell me about one of your Atari employees, Steve Jobs.**

Steve had this energy. He's the only one I'd ever find sleeping under his desk when I'd come in. He had this ability to not just envision but to get people to share his vision. I can think of 10 things he did at Apple that I would've thought were impossible. Because several of 'em, I've tried and failed at. Like getting music rights—I just wanted to do a downloading jukebox. I couldn't get any rights, let alone iTunes selling singles for 99¢.

**Are there entrepreneurs today who remind you of the way you started?**

I think Mark Zuckerberg is a fascinating entrepreneur, and Facebook is clearly an important thing. I really have some concerns, though, about privacy. Every kid has the right to have their teenage years forgotten. And I think we're losing that. I can honestly say that I'm glad that my teenage years are mostly forgotten.

**What have you learned about gaming over the years?**

Games are part of the DNA of most people. The ability to play anywhere, play anything, is bound to be a continuing saga of the world, whether it be smartphones, Oculus Rift, amusement parks, Chuck E. Cheese, what have you. I think it's all going to be blended into this interactive slurry of fun.

# g r o w



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# 40.Hollywood Blockbuster

**M** 1975 *Jaws* makes \$123 million at the box office.

The pop cultural landscape changed irrevocably in 1975, when Steven Spielberg's *Jaws* grossed a then unprecedented \$123 million. *Rocky* (\$117 million) and *Star Wars* (\$260 million) followed shortly thereafter, and by the early '80s, Hollywood was obsessed with conceiving, producing, and marketing megahit franchises. Over the past four decades, as the international box office has exploded, the formula has been perfected with smashes such as *E.T.: The Extra-Terrestrial*, *Titanic*, and *Avatar*. Here, a look at the ingredients that make a hit. —*Bilge Ebiri*

## THE 100 TOP-GROSSING MOVIES SINCE 1975\*

### KEY

**Best Picture Oscar winner**  
🏆

**Best Picture Oscar nominee**  
👍

**Best Special Effects Oscar nominee**  
👁️

**Music by James Horner, John Williams, or Hans Zimmer**  
🎵

\*Worldwide box office in millions during initial theatrical release. Figures are adjusted for inflation. Data: Box Office Mojo.

## BASED ON A NOVEL

Tom Hanks's total box office pull? More than \$8.4 billion worldwide.

Daniel Radcliffe was paid \$50 million to play Harry Potter in the final two films.

Universal Studios acquired the rights to Michael Crichton's novel *Jurassic Park* for \$1.5 million.

## NATURAL DISASTERS

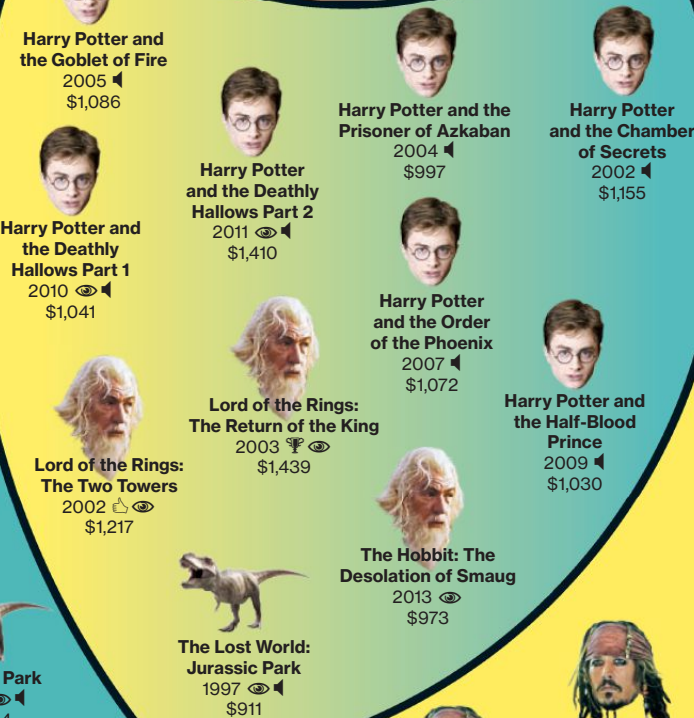
*Twister* holds a 58 percent rotten score on review aggregator site Rotten Tomatoes.

The *Pirates of the Caribbean* franchise has earned more than \$3.7 billion at the box office worldwide.

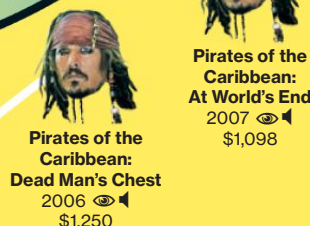
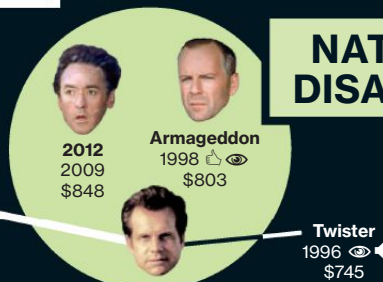
## FEMALE LEAD

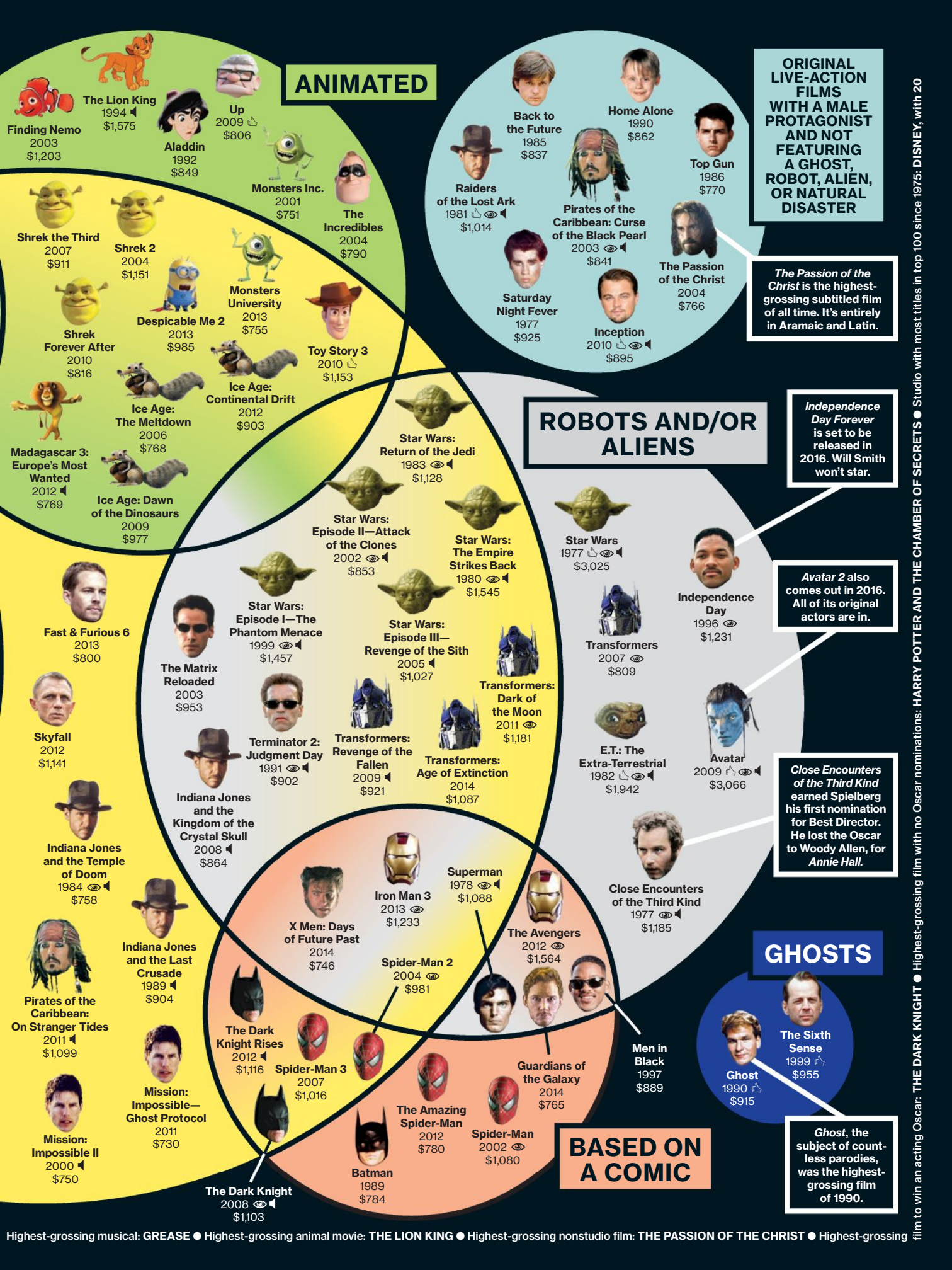
*Frozen* is the top-grossing animated film of all time.

*Titanic* is the top-grossing film since 1975.



## SEQUELS







# 39.The Jeep



1. Your phone line emits a dial tone

2. The modem dials a number to connect to an Internet service provider (ISP)

## 38.MODEM

❶ 1959 AT&T releases the Bell 101 modem for commercial use after a year of military testing.

The modem (short for “modulator-demodulator”) was designed to transmit digital signals over analog channels. Its origins date to 1920s newswire Teletypes, but the first mass-produced model was the Bell 101, which sent data through phones at a crushingly slow 110 bits per second (0.1 kilobits). It wasn’t until the 1990s Internet boom that speeds took off, as companies realized data would need to move a lot faster. By the time the 56-kilobit-per-second model, still dial-up’s fastest, became the desktop PC standard in 1998, 188 million people were online. Today modems are used to transmit cell phone, Wi-Fi, and satellite signals. Here’s what your old dial-up was doing while you heard it bleep, buzz, and bloop. —Shawn Hasto

📅 **1940** American Bantam Car produces the first Jeep for the U.S. Army.

By the end of World War II, 650,000 Jeeps had been produced for use on the battlefield. Veterans returning home spread the word about the vehicle's reliability and all-terrain capabilities and began buying them from the government. The Jeep brand had a series of owners before Chrysler bought it in 1987.

The next year, a Canadian anthropologist named Grant McCracken got a call from Chrysler. Could he help explain something? Lots of city dwellers were buying Jeeps, and the carmaker didn't understand why. McCracken visited with these Jeep owners and found two things—first, preppies, whose tastes were going mainstream, liked Jeeps as much as weathered chinos. Second, the Jeep, with its military roots and go-anywhere abilities, “was seen as the right car for the mean city streets,” he says.

In 1990, Ford Motor brought out the Explorer, a Jeep-inspired family-size vehicle built on a truck chassis, and in 1993 Chrysler unveiled the Jeep Grand Cherokee. At the time, U.S. car buyers were abandoning domestic models in favor of German and Japanese makes. But the SUV—and the pickup truck, too—were Detroit's alone. Ford, General Motors, and Chrysler came out with more and bigger models. With the margins they were making on SUVs and trucks, U.S. automakers had little need to produce cars good enough to compete with Toyota and Honda.

For a while, the strategy worked. Then, when gas prices rose and the financial crisis hit, it didn't. GM and Chrysler had to be bailed out. Americans still love their SUVs, though. Over the past year they've bought 5.2 million of them.

—Drake Bennett

📅 **1970** The Reserve Fund, the first money-market mutual fund, is launched by financial consultants Bruce Bent and Henry Brown.

Shadow banking isn't shadowy like the illicit, underground economy. It's shadowy like *Me and My Shadow*—attached to regular banking at the heels and doing all of the same things at the same time. Want to borrow money? You can get a loan from a bank—or you can do it the shadow way in the “repo” market by selling some Treasury bonds and promising to buy them back in a week for a slightly higher price, which represents the interest. Want to save money? You can deposit your cash in a bank—or you can do it the shadow way by, say, investing in a money-market mutual fund or taking the other side of one of those repo transactions.

Shadow banking took a while to make itself understood. Three years in, the Reserve Fund had only \$1 million in assets. Then the *New York Times* wrote about it in 1973, and the funds began to pour in. Paul Samuelson, the Nobel laureate, was so impressed by the invention of Bent and Brown that he said they deserved a Nobel of their own.

Variations on the theme quickly followed. In 1977 Merrill Lynch, Pierce, Fenner & Smith introduced a money-market mutual fund that you could tap by writing checks or using a credit card. Banks were outraged by the challenge to their core business. Then came repo, short for repurchase agreement. Securitization is also part of the shadow banking system. You don't need to ask a banker for a mortgage anymore.

## 37. Shadow Banking

You can go to a finance company that will sell your loan to a securitizer, who will pool it with others, create a security, and sell it in China. Your monthly principal and interest payments are going to Shanghai now.

It wasn't until 2007 that shadow banking acquired its name, from Paul McCulley, the chief economist of Pacific Investment Management Co. That belated recognition came one year before disaster. Regulators knew how to stop runs on ordinary banks but had no tools to prevent runs in the lightly supervised shadow banking system. The (renamed) Reserve Primary Fund, which was still one of the largest money-market mutual funds, held \$785 million of the debt of Lehman Brothers in September 2008. Shareholders pulled their money out when Lehman declared bankruptcy, the fund failed, and panic spread through the world financial system. Bent was cleared of wrongdoing, but his son, Bruce Bent II, was found negligent by a jury on a single claim of violating securities law.

Shadow banking survived the damage to its reputation. Its share of global financial assets slipped from 26 percent to 23 percent and has since rebounded to 25 percent, according to data compiled by the Financial Stability Board, an international body of regulators. And regulation aimed at making the financial system safer—such as the Dodd-Frank Act and the Basel bank capital rules—only partially affected the shadow banking system. Daniel Tarullo, the regulatory point person on the Federal Reserve's Board of Governors, warned in a speech last year that risks remain and “a more comprehensive reform agenda” is needed. —Peter Coy

6. A high-pitched whine helps the ISP modem tune out its own signal and listen to the other

3. An ISP modem answers the call and asks your modem for its hardware specifications

8. The ISP modem lists its compatible modes

10. This static is the ISP modem learning the voice of your modem so it knows which way to send different pieces of data

12. Once that's finished, the two modems agree on a final connection speed

13. Welcome. You've got mail!

4. Your modem replies with its specs

5. Both modems begin trying to determine how best to transfer data

7. Your modem lists its available connection modes

9. These bleeps and bloops are the modems agreeing on transmission frequencies

11. Your modem is doing the same, learning the voice of the ISP modem



**P 1974** Economist Arthur Laffer sketches his theory of tax policy over dinner with *Wall Street Journal* writer Jude Wanniski and Ford administration officials Donald Rumsfeld and Dick Cheney, kick-starting the rise of supply-side economics.

Forty years after one of the most famous dinner-napkin doodles in American history, Laffer, Cheney, and Rumsfeld reunited in Washington, D.C., on Nov. 10. —*Haley Geffen*

**Tell us what you were doing in 1974.**

**Rumsfeld:** I was called back from Brussels, where I was U.S. ambassador to NATO, to chair the transition to the presidency of Gerald Ford. Then I went back to Belgium, and then I was called back again to serve as White House chief of staff.

**Cheney:** The day after Nixon announced his resignation, I got a call from Don's secretary in Brussels wanting to know if I would meet Don at the airport—he was flying in the next day. When he arrived he was presented with a letter from the president asking him to come straight to the White House. He asked me if I would join him, and I was happy to do so. And so, on Aug. 9, 1974, we entered the back of the White House, where we had been during the first Nixon term.

**What was the economic climate at the time?**

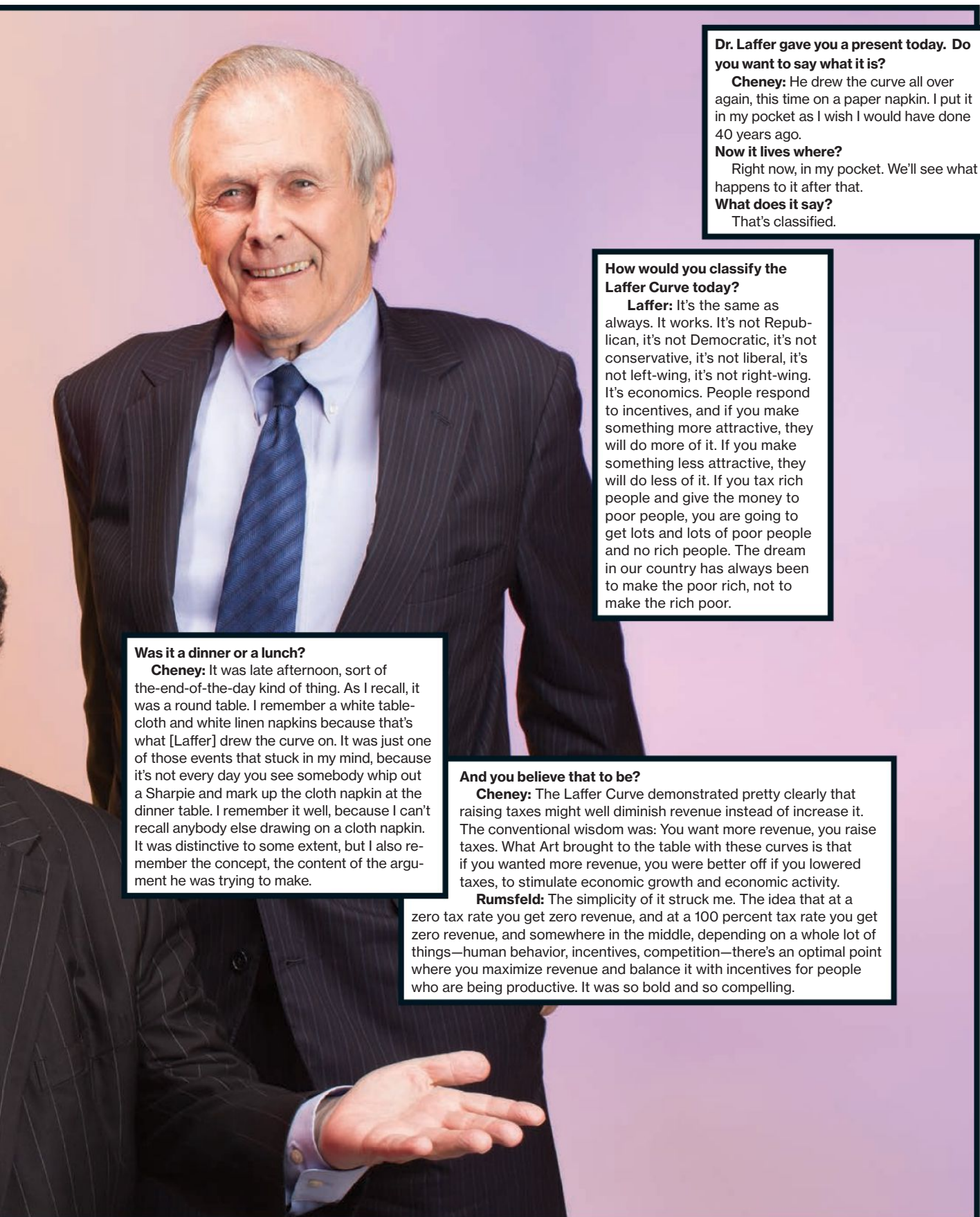
**Rumsfeld:** The country was faced with some serious economic problems. And what was coming up through the system was not what I felt represented the direction the country ought to go. So Dick [and I] were looking for all the help we could get.

**Laffer:** Ford was proposing something called Whip Inflation Now. It was a tax increase, a 5 percent surcharge. That was what he proposed. So I was talking to Don back then, who was White House chief of staff, and Dick, who was deputy chief of staff. I said, "Look, guys, we are not going to get 5 percent more revenue with a 5 percent tax surcharge. You may get 4 percent or 3 percent, or you may actually lose revenue. But you will not get 5 percent, because when you do a tax surcharge it's a really huge increase of progressivity. You will discourage people from reporting income and working."

**How frequently did you meet with Art Laffer?**

**Cheney:** During the last half of 1974, when we were setting up the Ford White House, economic policy was a big deal. Art would come by periodically. He saw Don more often than he did me, but I would see him occasionally. And one of those occasions was when he came to the Hotel Washington, at the Two Continents restaurant, as it was called then. That's where we sat down and talked about tax policy and Art drew the Laffer Curve.





**Dr. Laffer gave you a present today. Do you want to say what it is?**

**Cheney:** He drew the curve all over again, this time on a paper napkin. I put it in my pocket as I wish I would have done 40 years ago.

**Now it lives where?**

Right now, in my pocket. We'll see what happens to it after that.

**What does it say?**

That's classified.

**How would you classify the Laffer Curve today?**

**Laffer:** It's the same as always. It works. It's not Republican, it's not Democratic, it's not conservative, it's not liberal, it's not left-wing, it's not right-wing. It's economics. People respond to incentives, and if you make something more attractive, they will do more of it. If you make something less attractive, they will do less of it. If you tax rich people and give the money to poor people, you are going to get lots and lots of poor people and no rich people. The dream in our country has always been to make the poor rich, not to make the rich poor.

**Was it a dinner or a lunch?**

**Cheney:** It was late afternoon, sort of the-end-of-the-day kind of thing. As I recall, it was a round table. I remember a white tablecloth and white linen napkins because that's what [Laffer] drew the curve on. It was just one of those events that stuck in my mind, because it's not every day you see somebody whip out a Sharpie and mark up the cloth napkin at the dinner table. I remember it well, because I can't recall anybody else drawing on a cloth napkin. It was distinctive to some extent, but I also remember the concept, the content of the argument he was trying to make.

**And you believe that to be?**

**Cheney:** The Laffer Curve demonstrated pretty clearly that raising taxes might well diminish revenue instead of increase it. The conventional wisdom was: You want more revenue, you raise taxes. What Art brought to the table with these curves is that if you wanted more revenue, you were better off if you lowered taxes, to stimulate economic growth and economic activity.

**Rumsfeld:** The simplicity of it struck me. The idea that at a zero tax rate you get zero revenue, and at a 100 percent tax rate you get zero revenue, and somewhere in the middle, depending on a whole lot of things—human behavior, incentives, competition—there's an optimal point where you maximize revenue and balance it with incentives for people who are being productive. It was so bold and so compelling.



# 35. GAY MARRIAGE

**2000** Queen Beatrix of the Netherlands signs the world's first same-sex marriage bill into law.

The modern gay-rights movement traces its origins to the Stonewall riots in New York in

1969. It took three more decades for countries to begin allowing same-sex partners to wed. Today, gay marriage is recognized around much of the world. In the U.S., 66 percent of Fortune 500 companies provide health insurance for domestic partners. —Caroline Winter



U.S.\*  
2003



\*Same-sex marriage recognized by some states but not the federal government





SAM WALKER

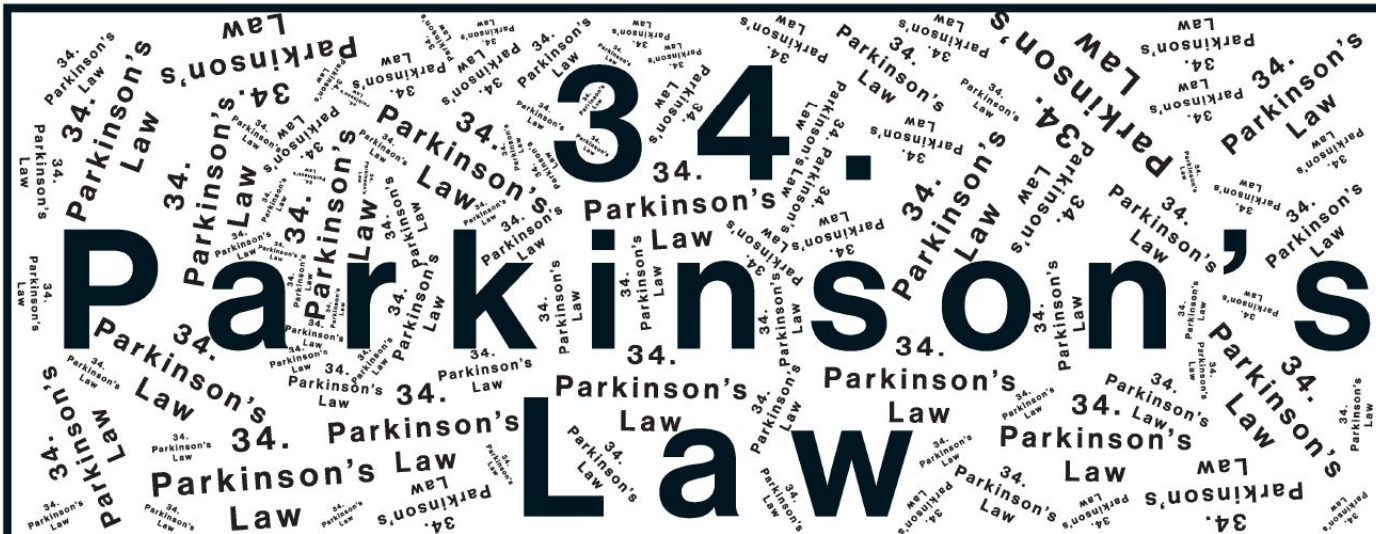
Global Chief People & Legal Officer, Molson Coors

“Our goal is to delight the world’s beer drinkers.”

To Molson Coors, delighting the customer is more than just producing great-tasting beers. It’s the total customer service experience. That’s why the people of Molson Coors are as focused on finding ways to produce, package, and deliver great beer as they are on the recipes that make their brews so satisfying. It’s both process and product, and they are dedicated to continually improving both. At Perkins Coie, we’re as committed to delighting our clients as Molson Coors is to ensuring complete customer satisfaction.

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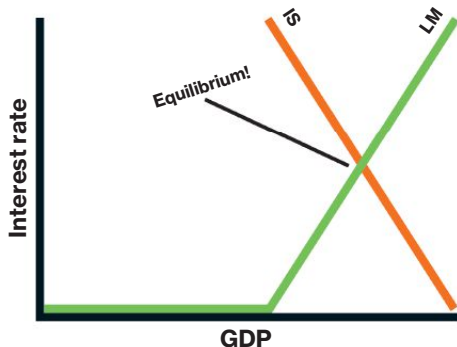


📅 1955 The *Economist* publishes Cyril Parkinson's theorem on time management.

"It is a commonplace observation that work expands so as to fill the time available for its completion." This adage, written in 1955 by historian Cyril Northcote Parkinson, captured a feeling both modern and timeless and came to be known as Parkinson's Law. It spawned a best-selling 1958 book and has for decades inspired life-hackers and self-help gurus aiming to vanquish the human tendency toward anxiety-producing, productivity-squelching procrastination. "A task will swell in (perceived)

importance and complexity in relation to the time allotted for its completion," wrote Timothy Ferriss, author of *The 4-Hour Workweek*, appropriating the idea 49 years later. The solution? Set urgent deadlines, program your Pomodoro stopwatches, and stick to the program. No dillydallying, and no toiling over inconsequential details. (Like explaining the Pomodoro technique; look it up on Wikipedia.) Mustering mental discipline is, of course, challenging, especially now that smartphones and e-mail make it easy to second-guess, edit, and retouch work from anywhere at any hour. I'd rewrite this a few more times, but my deadline has arrived. —Caroline Winter

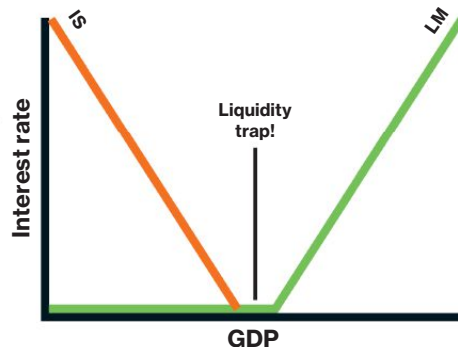
# 33.IS-LM



IS-LM is at the heart of computer models used to forecast employment, inflation, and growth

📅 1937 Sir John Hicks, a British economist, introduces the IS-LM model, the workhorse of macroeconomics.

IS-LM (investment-savings, liquidity-money) is an explanation of the Keynesian view of how an economy works. The economy is in equilibrium at the intersection of the IS line and the LM line. At that level of interest rates and gross domestic product, the supply and demand for savings (IS) is in balance, and so is the supply and demand for money (LM). If there's pessimism about growth, the IS line shifts to the left and the equilibrium interest rate falls. But if the IS line shifts too far left, even a zero-interest rate isn't low enough to stimulate economic growth. That's a "liquidity trap." At that point, conventional monetary policy is, in a classic description, as useless as attaching a string to an anvil and pushing on the string. —Peter Coy



The U.S. has been in a liquidity trap since 2008, when the Fed cut its key rate to 0 percent to 0.25 percent

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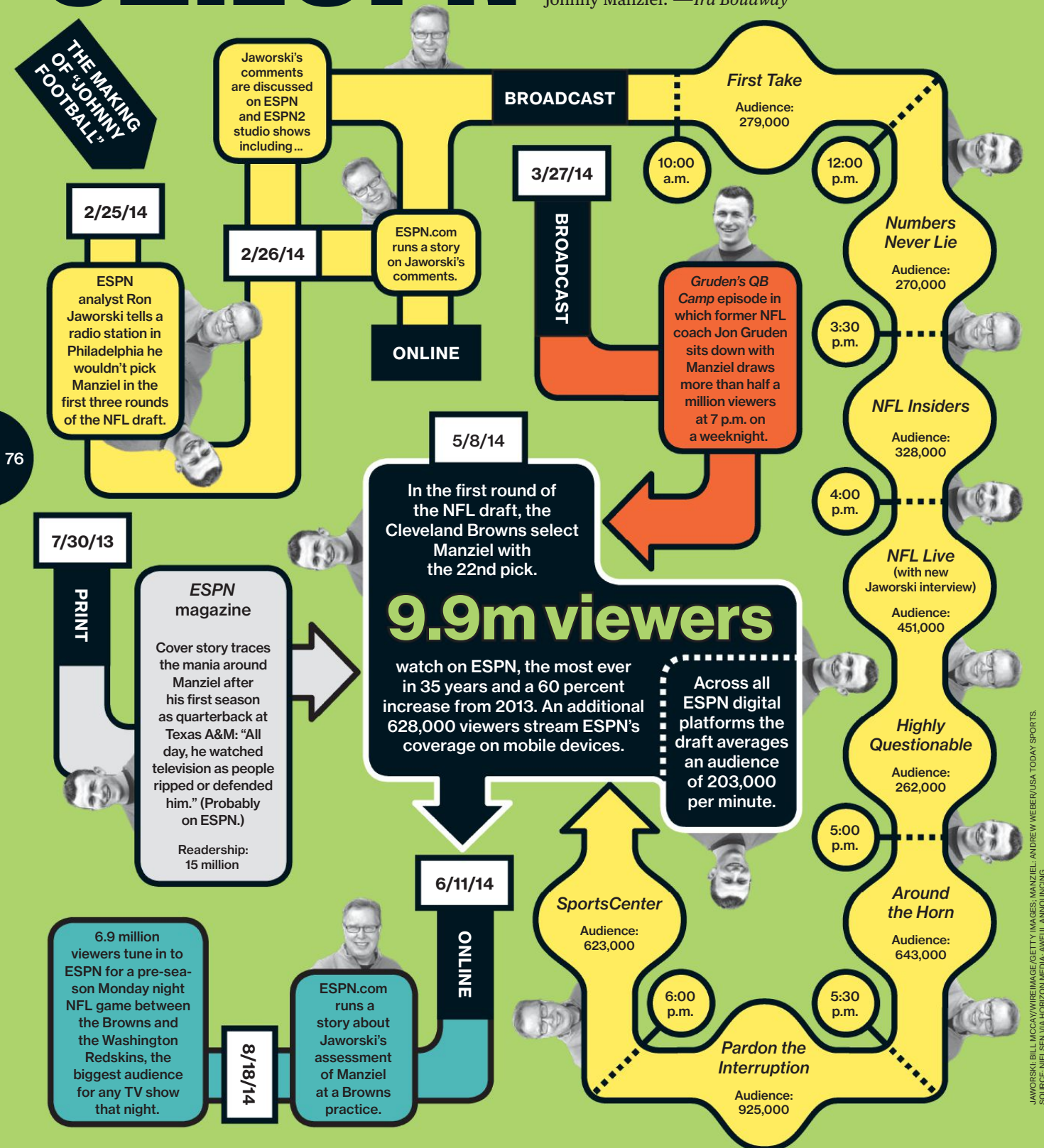
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# 32.ESPN

**M 1979** The Entertainment and Sports Programming Network goes on air.

Live sports are only part of what has made ESPN the most lucrative brand in media. Through its eight U.S. TV channels, its websites, and its radio stations, ESPN hypes, carries, and dissects sporting events in a self-sustaining cycle that demonstrates the power of vertical integration. Case in point: the frenzy surrounding former Texas A&M University quarterback Johnny Manziel. —Ira Boudway



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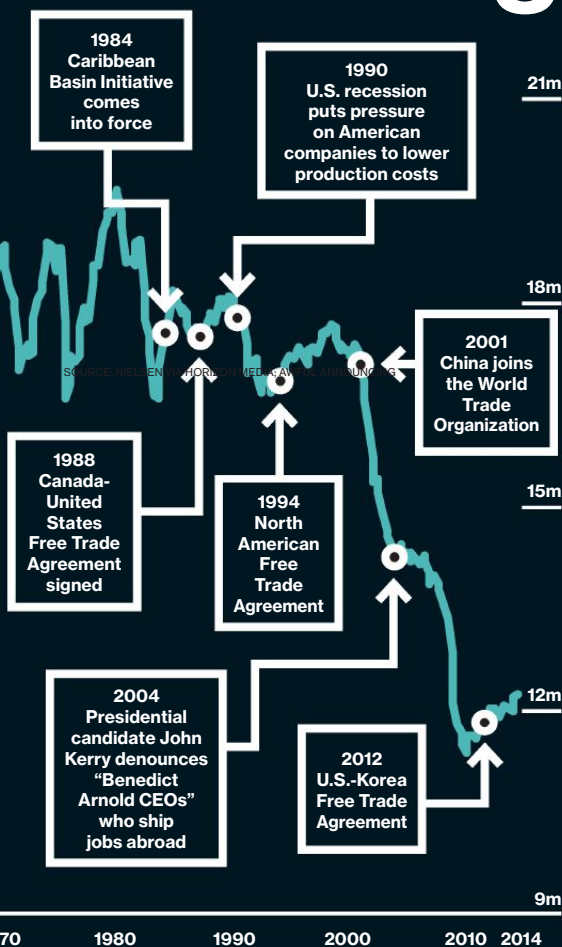
# 31. Outsourcing

## MANUFACTURING JOBS IN THE U.S.

1978 Delphi Automotive, then a unit of General Motors, opens its first plant in Mexico. Today it has 50.

While stumping for the presidency in 1992, Texas millionaire Ross Perot warned of “the great sucking sound” of jobs moving to Mexico if the North American Free Trade Agreement was passed. But the outflow of U.S. manufacturing jobs had begun more than a decade earlier, spurred in part by a strong dollar. A succession of trade agreements, the rise of China and India, and adoption of the Internet then sped the process along.

—Cristina Lindblad



When Jack Welch came out in 2009 against the concept that the purpose of a corporation is to maximize value for shareholders, it was like the pope attacking Catholicism or Tiger Woods dissing golf. “On the face of it, shareholder value is the dumbest idea in the world,” the former chief executive officer of General Electric told the *Financial Times*. “It is a dumb idea. The idea that shareholder value is a strategy is insane.”

No CEO was more linked to the shareholder value concept than Welch in his years as chairman and CEO of GE from 1981 through 2001. GE kept its profits on a miraculously even upward trajectory for years. One common technique was to neutralize a big one-time gain that would cause a spike in earnings by arranging to take a one-time

loss of about the same size in another business. That didn’t serve any business purpose but did impress Wall Street analysts. All the while, Welch closed down businesses, moved factories abroad, and shifted attention to the money-intensive, worker-light GE Capital operation. His nickname was “Neutron Jack” after neutron weapons, which supposedly killed people while leaving buildings intact.

Applied correctly, shareholder value theory is neither dumb nor insane. American accounting theorists Charles Sprague in 1907 and Henry Hatfield in 1909 developed the idea that a company’s books should be prepared from the perspective of the “proprietors,” which to them included shareholders of corporations. In a 1970 essay for the *New York Times Magazine*, Milton Friedman, the U.S.’s most famous free-market economist, argued that “the social responsibility of business is to increase its profits.” In 1983 economists Eugene Fama and Michael Jensen wrote about how to make sure that corporate managers act in the best interests of the owners—that is, shareholders.

The idea works fine as long as the shareholders are assumed to be enlightened people who care about long-term returns and (maybe even) good citizenship. It doesn’t work when maximizing shareholder value is taken to mean moving heaven and earth, Jack Welch-style, to beat quarterly earnings estimates.

In any case, shareholder value has lost its cachet in the 21st century. The new buzz phrases are corporate social responsibility, triple-bottom-line accounting, and stakeholder value, all of which make explicit the common-sense notion that companies have a higher purpose than making the numbers. —Peter Coy

78

## 30. SHAREHOLDER VALUE

1970 Milton Friedman’s essay “A Friedman Doctrine—The Social Responsibility of Business Is to Increase Its Profits” appears in the *New York Times Magazine*.

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## 80

In the beginning, software was free, something you needed to make the hardware run. Then Microsoft and others demonstrated that people would pay for proprietary code, and for a long while software wasn't free. But proprietary code was often clunky, and what worked on one kind of computer had to be re-created on others. Soon people realized there was a better way, and software became free again, sort of. Open-source

United States Savings Bond

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## DONALD HIGGS/GETTY IMAGES; DATA: 401(K), U.S. DEPARTMENT OF LABOR,

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# Bagging success with Asian consumer insights

## A TAPPING INTO ASIAN INSIGHTS

Companies can tap into Asian consumer insights with a network of leading market research, branding, digital and marketing agencies from Singapore.

## E WORLD-CLASS TALENT

Unilever's Four Acres Singapore campus and LVMH's Asia Pacific Talent Development Centre are examples of how companies are grooming Asia's future leaders in Singapore.

## B DRIVING GLOBAL BRANDS

Top consumer businesses like Procter & Gamble, Unilever, Diageo, Cotton On and LVMH manage global brands from Singapore.

**C LEADING WITH R&D**  
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**D A GLOBAL SUPPLY CHAIN**  
20 of the world's top logistics providers including UPS and FedEx have large operations in Singapore. This has enabled companies like Estée Lauder and LVMH to set up regional distribution centers here.





# 26 THEA





# AK-47



● 1947 The Soviet Army introduces a gas-operated assault rifle, named for inventor Mikhail Timofeyevich Kalashnikov.

By Christopher Buckley

For reasons that escape me, somewhere in my closet is a T-shirt with a silhouette of an AK-47 on its front, personally inscribed to me by the AK's inventor, Mikhail Timofeyevich Kalashnikov. Now I remember: A friend encountered him at a gun show (where else?) and had him autograph the shirt for me. He said that Mr. Kalashnikov "couldn't have been nicer. A very warm guy."

Fast-forward 15 years. Another friend rang me to ask, "Would you like to shoot an AK-47?" Next day I found myself in a gravel pit in Maine holding the gun that changed the world. I aimed and squeezed the trigger. The 30-round clip emptied in less than the time it took to type this sentence. There was nothing sleek about it. The gun's stubby and sort of clunky and makes a low-tech buda-buda-buda sound, far different from the crisp crack and whistle of an M-16.

But then, you've surely heard it yourself, either on the evening news or in an Oliver Stone movie. Most days, the newspaper has a photo of someone firing it or holding it aloft. Very often, that person will be 12 years old. As C.J. Chivers writes in *The Gun*, his definitive history of the AK-47 and its predecessors, the Gatling and Maxim guns, "Anywhere large numbers of young men in civilian clothes or mismatched uniforms carry Kalashnikovs is a very good place not to go; when Kalashnikovs turn up in the hands of mobs, it is time to leave."

AK stands for *Avtomat Kalashnikova*, after its inventor, then a 28-year-old former Soviet tank commander; 47 refers to 1947, the year it came online. Chivers is at pains to note that Comrade Kalashnikov was "not the sole creator of the original AK-47," but rather "a mid-level player in a large system, and never its engine." Stalin had tasked his military complex with coming up with a small arms automatic weapon "that would ensure the safety of the *rodina*, the great Russian homeland, and equip fraternal forces in the expanding Kremlin sphere." He also wanted a hero. These were in short supply, since he had killed most of them—along with scoundrels—during the purges. Thus most of the credit was given to Comrade Kalashnikov.

The irony, as Chivers documents, is that the AK-47 ended up being "christened with blood not as a tool for liberation or to defend the Soviet Union from invaders. It made its debut smashing freedom movements. It was repression's chosen gun, the rifle of the occupier and the police state."

It was used to put down uprisings in East Germany in 1953 and in Hungary in 1956. In 1962 the first martyr of the Berlin Wall, a young man named Peter Fechter, was shot ►



◀ with AKs by East German border guards and left to slowly bleed to death. During the late 1960s and early '70s, the Kalashnikov was the trademark weapon of the Palestine Liberation Organization. The Viet Cong and the North Vietnamese Army used it effectively. At the 1972 Munich Olympics, Black September terrorists trained theirs on Israeli athletes. Salvador Allende, president of Chile, turned one on himself in 1973 as coup plotters closed in. Both sides in Northern Ireland used it to work out their differences over the doctrines of the Trinity and Immaculate Conception.

President Anwar Sadat went down in a hailstorm of AK rounds on the reviewing stand in 1981. The AK's become so ubiquitous in Africa that the acronym now also stands for "Africa Killer." Chinese troops used it to cleanse Tiananmen Square of student protesters in 1989. That year saw it put to at least one good use, on Christmas Day, when Romanian tyrant Nicolae Ceausescu and his wife met their end in a fusillade of AK fire. But such satisfying instances are rare. When Osama bin Laden spoke to the world by video after Sept. 11, his AK-47 was there beside him, a real-life version of Gollum and his "preciousss."

The Kalashnikov, writes Chivers, "marks the guerrilla, the terrorist, the child soldier, the dictator, and the thug—all of whom have found it to be a ready equalizer against morally or materially superior foes." There may be as many as 100 million in the world today, one for every 70 people.

How did this come about? Simple. Literally—the weapon's genius lies in its simplicity. A child can learn how to operate it in minutes. A masterpiece of user-friendliness, it has relatively few working parts. And here, perhaps, is the strangest irony of all, given that it was produced by the Soviet Union, which could barely design a toaster: It almost never breaks. AKs made in the early 1950s are still in use in Afghanistan in the 21st century. The average disassembly time for an M-16, the standard small arm of the U.S. Army infantry, is 80 seconds; for the AK, it's 34 seconds.

On the 60th anniversary of its invention, Vladimir Putin issued a chest-thumping celebratory decree. Today, under his leadership, the Crimea and Ukraine have become the latest AK-47 fields of fire. On the occasion of Kalashnikov's 90th birthday, the gun's inventor received his country's highest honorary award, the Hero of the Russian Federation medal.

In Chivers's account, Kalashnikov emerges as an elusive and ambivalent figure. But then he was a product of the Soviet system, which persecuted, among so many others, his own father. On the one hand, Kalashnikov says, "I sleep soundly." But his memoirs strike a more ruminative tone: "Arms makers have strange destinies!" he writes. "They are saluted with shots they never expected, and it is not orations of music that remind one of jubilees, but moans and screams."

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❶ 2000 The human genome is decoded for the first time.

By Craig Venter

There have been lots of stories written about all the hype over getting the genome done and the letdown of not discovering lots of cures right after. The biggest finding when we announced the genome in 2000 was that we only had 20,000-some-odd genes. Some people thought that because we were humans, we had to have more than every other animal. We had to have 10 times more, 100 times more. Everybody wanted there to be this nice, linear path where you have a gene for each trait—you know, there's a gene that codes for your nose. It's so naive.

World's largest genome



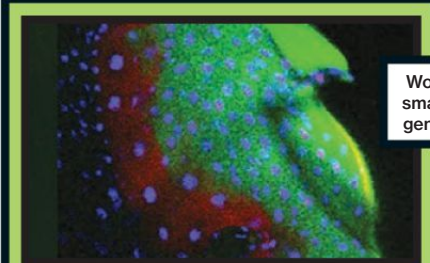
**PROTOPTERUS AETHIOPICUS**  
(Leopard lungfish)

133 billion DNA base pairs



**HOMO SAPIENS**

3.2 billion DNA base pairs



World's smallest genome

**NASUIA DELTOCEPHALINICOLA**,  
a microbe that resides in insects

112,000 DNA base pairs

Only now are we really starting to appreciate all the changes that have occurred over the past 15 years. On the computing side and the sequencing side, both of those just passed a cost and performance threshold that will allow for a major impact on medicine. We're just now where I wanted to be in 2000. In the last three years, we've seen some impact on medicine with the discovery of the driver mutations in cancer. If you have lung cancer, the most important thing you can know is your genetic code. Roughly 4 percent of people with lung cancer will have this ALK gene translocation that seems to indicate that Pfizer's drug has a better-than-60-percent chance of shrinking your tumor. Instead of a blockbuster drug that you can give to everybody that has cancer, you end up with a drug that you give to 4 percent of the people we know can benefit from it. That is a fundamental change in medicine.

There's been a huge increase in the last three years of people measuring these driver mutations, but revolutions in medicine are slow. My understanding is only about 3 percent of cancer patients in the U.S. get genetic screening of their tumors. We have the tools to do it now, but the physicians don't have the training and the know-how to help get this implemented to benefit their patients. The only way to come up with all of the cures that were promised is to sequence large numbers of genomes. For each gene in your genome, you quite often get a different version of that gene from your father and a different version from your mother. We need to study these relationships across a very large number of people. It's going to be important to know what the variant is you got from your mother and from your father, and whether that correlates with 30 other variants across the genome that are associated with susceptibility for a certain type of cancer, for example.

That's why we started my new company Human Longevity. We're trying to sequence 40,000 genomes in the next six months and then scale up to 100,000 a year. We have a goal of getting to a million genomes by 2020. It's around \$1,000 to \$1,500 to do a genome today, but we're counting on continued Moore's Law-type change to take it down to a few dollars per genome.

We've proven that DNA is our software, the software of cells. But genomics can't really, truly impact medicine—get us to preventative medicine, get us to new treatments—until we can truly read that software. We have less than 1 percent of the information that people will have in the future. So to me, we're just starting the genomic era now. —As told to Ashlee Vance



# 24 PERESTROIKA

🕒 **1986** Mikhail Gorbachev eases government controls on industry and allows workers' cooperatives to set up private businesses.

When Soviet leader Gorbachev launched his plan for perestroika—or restructuring—at a meeting of the Communist Party Central Committee in January 1986, he promised it would deliver the economic and political modernization that his countrymen had “long been yearning for.” The upheaval that followed, however, wasn’t what he had in mind. Within six years, the Union of Soviet Socialist Republics had disintegrated, diminishing Moscow’s influence abroad and opening the door to chaos at home.

Over the next decade, Russia endured a bloody coup attempt, the looting of state assets by ruthless oligarchs, and the collapse of the national currency. Now the country seems to be turning resolutely away from three things Gorbachev actually intended to achieve with perestroika: reduced state management of the economy, greater political freedom, and warmer relations with the West.

President Vladimir Putin and his allies have seized Russia’s richest companies and banks, ousting and sometimes jailing their leaders. The Kremlin has assumed control of major news outlets and stamped out political opposition. Moscow’s intervention in Ukraine and its probing of NATO defenses in the Baltics and elsewhere threaten to erase more than a quarter-century of peace with the West that began with the 1987 deal between Gorbachev and U.S. President Ronald Reagan to reduce the size of their countries’ nuclear arsenals. “The world is on the brink of a new Cold War,” Gorbachev, now 83, lamented at a Nov. 8 ceremony marking the 25th anniversary of the fall of the Berlin Wall. —Carol Matlack

FISH: COURTESY YULCHIA CHANG; CYRUS: JAMIE MCCARTHY/GETTY IMAGES; MICROBE: APPLIED AND ENVIRONMENTAL MICROBIOLOGY; PERESTROIKA: BOB GALLERATI/VA PHOTO





1

2 European Organization for Nuclear Research, the particle physics research laboratory based near Geneva. The acronym is from the French version of the name.

3 "Information Management: A Proposal"

4 You know what hypertext links are.

5 "A problem, however, is the high turnover of people. When two years is a typical length of stay, information is constantly being lost."

6 "For this to be possible, the method of storage must not place its own restraints on the information. This is why a 'web' of notes with links (like references) between them is far more useful than a fixed hierarchical system."

7 "The system we need is like a diagram of circles and arrows, where circles and arrows can stand for anything.... We can call the circles nodes, and the arrows links."

Tim Berners-Lee(1) was a computer scientist at CERN(2), when in March 1989 he wrote a memo(3) suggesting the creation of a network of hypertext-linked(4) nodes to help his fellow researchers(5) organize and share information about the experiments they were running. His original name for it was "Mesh"(6). A year later, when writing the code for it, he changed it to the World Wide Web(7). The original versions of what would eventually be called websites(8) were rudimentary(9). Nine years later the term Web 2.0 was coined to describe the more dynamic, social(10), video-embedded(11), ad-saturated(12) medium we enjoy today. Now anyone on earth can look at and create her own meme(13) from, say, an amusing photograph of a pet(14).  
-Drake Bennett(15)



8 In 1996 they still looked like this.

9 "Storage of ASCII text, and display on 24x80 screens, is in the short term sufficient, and essential. Addition of graphics would be an optional extra."

10 See No.51 Facebook (page 50)

11 No.66 YouTube (page 35)

12 No.6 Google (page 108)

Nailed It!



13 The term "meme" was coined by evolutionary biologist Richard Dawkins.



14



15

# 22. ONE-CHILD POLICY



China's population in 2014

1.39b  
1.77b

A difference of  
**380m**  
—about the number of people living in the U.S. and Britain combined

Its estimated 2014 population had the one-child policy not been introduced

**P 1979** After a decade of promoting family planning, the Communist Party of China, under the new leadership of Deng Xiaoping, introduces compulsory limits on childbearing.

为四化只生一个孩子好  
THE 4 MODERNIZATION REQUIRES ONLY ONE CHILD FOR EACH FAMILY

# 21. Refrigeration

87

**S 1930** DuPont manufactures Freon, sparking the adoption of residential and commercial refrigeration.

By Tom Colicchio

Refrigerated containers—starting with railcars, then trucks, and then taking it a step further to air carriers—allow us to enjoy a more global cuisine. We get to eat mushrooms from the Pacific Northwest and tuna from Asia. We're in the middle of white truffle season right now, and they'd be terrible if we couldn't get them from Italy or Croatia.

But here's the downside: It moves us away from local food systems. This is obviously awful for our carbon footprint. And even though we're shipping stuff and it gets refrigerated, fruits and vegetables are typically picked when they're not ripe, then gassed with chemicals to stay supple. Everything is very uniform. None of those big red tomatoes are going to get beat up in their perfectly sized box. We also expect things that are out of season to be available all the time. So people's standards have dropped completely—they think they don't like strawberries because they're these giant, tasteless cotton ball-like things most of the year.

The farm-to-table movement that's become popular in the past two decades is an attempt to fix this. But it's ridiculous. Everything starts on a farm and ends on a table. What happens in between is what's crucial; refrigeration and the convenience of having any food when we wanted it stripped the idea of eating

seasonally. And local food gets fetishized. Diver scallops are on every menu, but no one's actually diving for scallops. Local peas? Bullshit. No, they're not. There was a study done a couple of months ago here in New York that determined that something like 80 percent of the food out there nationally is mislabeled, even on restaurant menus.

The general public is still interested in taking something out of the freezer and popping it into the microwave, but there are certain things chefs can take the lead on. We're all after flavor, something that tastes delicious. I have a pretty good-size garden, and there is absolutely nothing like taking a green bean off the plant and eating it immediately. It tastes like sugar. Two hours later, it doesn't. Trying to cut back the time, the distance between plant and plate—that's what's important.

Of course, relying less on refrigeration is going to cost more. The only way we can support that is if we can tell that story to our customers so they pay more. You've also got to get the markets to come along to the idea. But too often, we're preaching to the converted.

Back in the days of the icebox—remember *The Honeymooners*?—it used to be that stuff was going ripe in there. The idea of an intermezzo course, some sorbet between dishes at a nice restaurant, exists because the fish would be so rank, the chef would have to get the smell out of your mouth. Or the chef would have to cook cod with mace, nutmeg, allspice, and other strong flavors. Refrigeration fixed this. But it killed fresh food in the process.

—As told to Kurt Soller



# 20. AMAZON.COM

1994 Jeff Bezos founds an online bookstore in his suburban Seattle garage.

From its earliest days, when Amazon.com still mostly sold books, the company's founder, Jeff Bezos, exhorted his employees to ignore the competition and stay focused on customers. Amazon's main rival back then, Barnes & Noble, was still a huge, fearsome force in the bookstore business—and it sued (unsuccessfully) over Amazon's claim of being "the world's largest bookstore."

Those were the simple days.

Amazon left Barnes & Noble in the dust while expanding into selling just about everything, from furniture, kitchenware, and clothes to portable digital devices like the Kindle and cloud computing services. With that expansion came a raft of new rivals. The company is now competing against—and, in some cases, simultaneously working with—Google, Apple, IBM, and Alibaba, among other players large and small. (And that leaves out Bezos's two main side projects, the Blue Origin space-travel company and the *Washington Post*.) Amazon is fighting on so many fronts, you need a battle map to keep track of it all.

—Brad Stone

Amazon's pioneering cloud division—used by Netflix, Airbnb, and Dropbox, among many others—is one of the fastest-growing software businesses ever.

## THE MANY BATTLES OF BEZOS

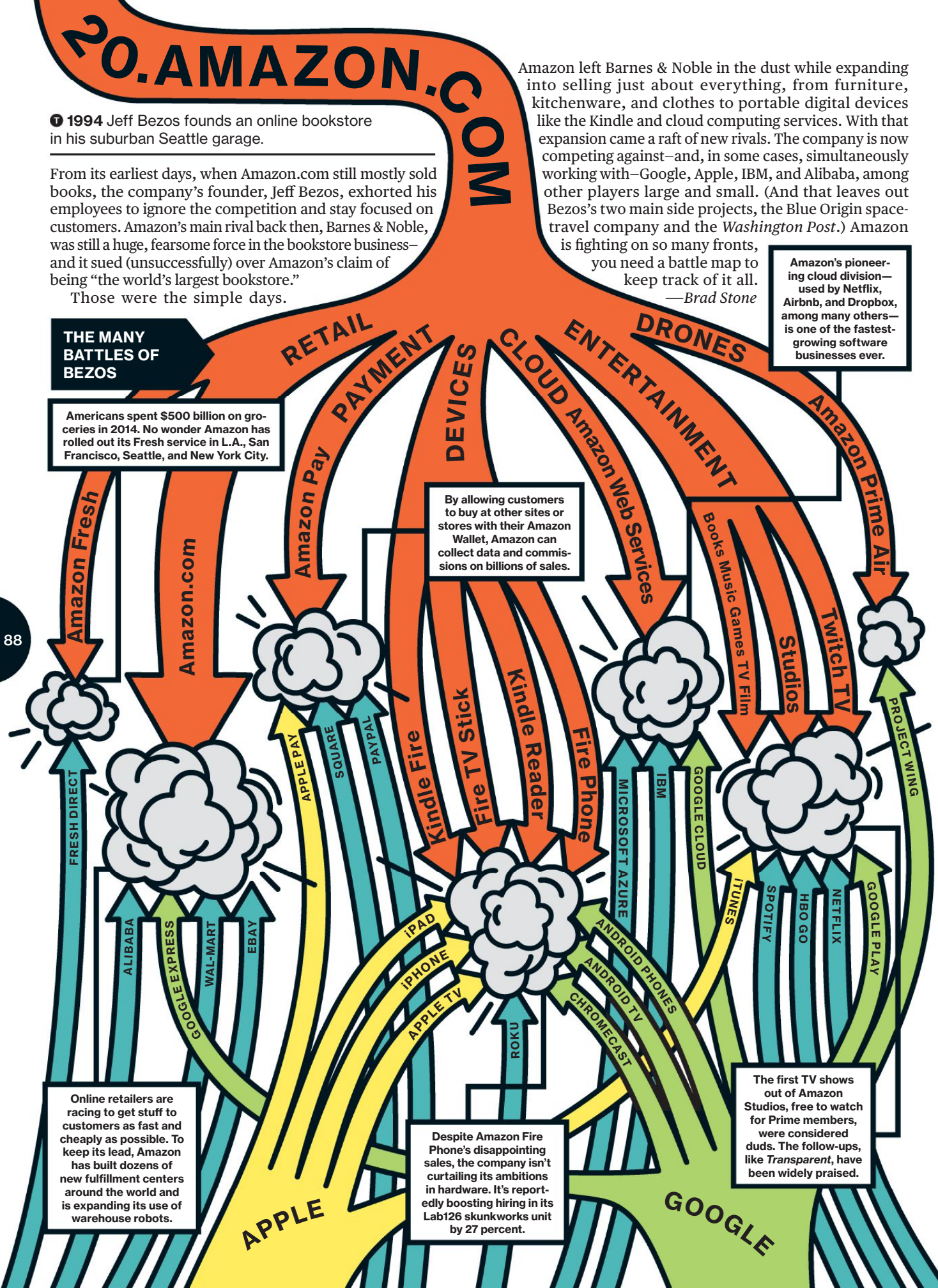
Americans spent \$500 billion on groceries in 2014. No wonder Amazon has rolled out its Fresh service in L.A., San Francisco, Seattle, and New York City.

By allowing customers to buy at other sites or stores with their Amazon Wallet, Amazon can collect data and commissions on billions of sales.

Online retailers are racing to get stuff to customers as fast and cheaply as possible. To keep its lead, Amazon has built dozens of new fulfillment centers around the world and is expanding its use of warehouse robots.

Despite Amazon Fire Phone's disappointing sales, the company isn't curtailing its ambitions in hardware. It's reportedly boosting hiring in its Lab126 skunkworks unit by 27 percent.

The first TV shows out of Amazon Studios, free to watch for Prime members, were considered duds. The follow-ups, like *Transparent*, have been widely praised.





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# 19.CREDIT

■ **1950** Frank McNamara, the founder of Diners Club Card, charges dinner at Major's Cabin Grill in New York—the first transaction made with a credit card.

By John Lanchester

It's a trick question sometimes asked of business students: What is the most effective single word in the history of marketing, a word that managed by itself to almost double the market of a product? The answer: "Repeat." Some shampoo-selling mastermind took the standard "Lather, rinse" and upgraded it to "Lather, rinse. Repeat." The word didn't precisely double sales of shampoo, because not everyone bothers, but it came pretty close. I don't think we know the name of the genius who first put these six letters on bottles of shampoo, but whoever he or she was, their legacy is a tribute to the extraordinary impact you can have with a single word.

My candidate for the most disruptive idea of the last 85 years is also a single word. Once upon a time there was a thing called debt. You don't have to be all that old to remember being brought up to think it was something to avoid. In fact, the aversion was stronger than that. Everyone from the poor to the upper middle classes regarded debt with horror, as a form of servitude, a permanent shadow over life.

And then debt turned into something else: something called credit. Of course, from the economic point of view, every debt is a credit somewhere else, so there is a sense in which debt and credit are the same thing. Psychologically, though, the story is very different. Debt is a negative: a burden, an obligation, a drag. Credit is an opportunity, an opening, a way out, a way forward; it's full of possibilities and potential. Debt is etymologically linked with owing; credit is linked with belief, with faith.

At the peak of the credit bubble in 2006-07, rich and poor alike were deluged with offers of credit. In one week I counted a dozen unsolicited offers of credit, including calls from my bank, cold calls, letters, and e-mails. Ringing up my bank, even before I got a chance to be tortured by the automated phone system, I would be offered credit: "Would you like a loan?" My bank would ask me that before it even knew who I was. Corporations often try to be friendly and personable,

as if they are actual people. Imagine for a moment what this behavior would be like in a human being: going round the street, walking up to total strangers, and before they even say hello, asking, "Can I lend you money?"

The invention of "credit" is apparent on balance sheets everywhere. At the start of the 1950s, American households had debt of 0.5 times their annual income. By the time the credit bubble popped, they had debt of more than twice their annual income. That's an increase of more than 300 percent. That debt paid for a lot of things, many of them having to do with the life people most wanted, which is almost always the one that is just out of reach. By definition, you can't quite afford the thing that is just out of reach. So you borrow and stretch for it. You might not willingly and consciously go into debt to do that. But if all you're doing is exploiting the potential of credit—well, that's different.

Except, of course, it isn't. The gigantic expansion of debt is possibly the single most striking feature of modern economies over the last few decades. It isn't only individuals who have blown out their balance sheets; corporations and governments have done it, too, and on an even bigger scale. The figure for total worldwide debt varies according to who's counting, but a credible estimate from 2013 put it at 313 percent of global gross domestic product. Humanity has a mortgage more than three times the size of its income.

Until very recently, it was unfashionable to worry about this, either personally or at the macro level. Because every debt is a credit and vice versa, and we owe to each other rather than to the inhabitants of another planet, the system itself was sound. But the expansion in credit was like a climb up a very long, very steep mountain. The credit crunch was the moment when you do what you're not supposed to do, and you look down. We gave ourselves a huge scare and started to wonder what we've done.

As the long slog out of the Great Recession continues, and with it the blame and recrimination and political arguments, let's not forget the impact of one beautiful, dangerous small word, one whose associations are so positive and whose consequences are, sometimes, so ruinous.



About 38 percent of U.S. families carry credit card debt, with \$2,300 the median owed.

Approximately 86 percent of families own a car and owe a median of \$14,000 on it.

## THE AMERICAN DREAM ON LOAN

65.2 percent of families own their primary residence; 42.9 percent have mortgages, the median of which is \$116,000.

Just over 10 percent paid for furniture, appliances, and other durable goods on the installment plan. The median amount for this kind of debt is \$3,300. For couples with one child or more, it's \$4,000.

Of families where the head of household was younger than 40, 38.8 percent had outstanding education loans. The median amount owed was \$29,800.

In a 2013 survey for the Federal Reserve, 74.5 percent of families had some kind of debt. The median amount outstanding was \$60,400. Couples with at least one child owed \$120,800.

For one-kid-plus households, the median mortgage is \$140,000—about twice pretax income.



PROP STYLING BY PRISCILLA JEONG; HAIR AND MAKEUP BY SILVIA CINCOTTA  
DATA: SURVEY OF CONSUMER FINANCES, BASED ON INTERVIEWS WITH 6,026 FAMILIES,  
FEDERAL RESERVE BULLETIN, PUBLISHED IN SEPTEMBER 2014





100

1961

1965

1948

Stores as of 1959

Brothers Dick and Mac McDonald open the first McDonald's, in San Bernardino, Calif.

Ray Kroc purchases the rights to the McDonald's name for \$2.7 million.

McDonald's goes public at \$22.50 per share.

The first restaurants open outside the U.S., in Canada and Puerto Rico.

1967

1975

1973

1971

The first drive-through restaurant opens, in Sierra Vista, Ariz., and the Egg McMuffin goes nationwide.

Quarter Pounder is introduced. The Golden Arches come to Sweden.

Restaurants open in Japan, Australia, and Germany.

5,000th restaurant opens, in Kanagawa Prefecture, Japan. Belgium is added to the roster.

Happy Meal is introduced. Openings in Brazil and France.

6,000th restaurant opens, in Munich.

1978

1979

1980

92

Stores as of 1978

Stores as of 1968

18. McDonald's

■ 1954 After visiting the McDonald brothers at their restaurant in San Bernardino, Ray Kroc signs on to be McDonald's first franchising agent, launching the world's biggest fast-food empire.

10,000

Stores as of 1988

1987

1990

1993

Fresh salads appear on the menu in the U.S.

Mickey D's announces it will begin phasing out foam containers. Openings in Russia and China.

The first McCafé opens, in Melbourne.

A group of French farmers led by José Bové reduces a McDonald's in Millau, France, to rubble to protest globalization.

1999

2014

First restaurant opens in Vietnam.

35,000

Stores as of 2014

2012

2004

2003

More than 100 fast-food workers from McDonald's and other chains walk off the job in New York City in demand of higher wages and the right to unionize.

Morgan Spurlock's 2004 documentary film *Super Size Me* premieres.

The word "McJob" appears in Merriam-Webster's Collegiate Dictionary.



For your business,  
your employees and your world.

## HOW DO YOU MEASURE BETTER?





# 17. FIXED-RATE MORTGAGE

**F 1933** The Home Owners' Loan Corp. introduces a 15-year, self-amortizing home loan.

The standard mortgage that now underpins the housing market first appeared during the Great Depression. The stock market crash of 1929 sparked a wave of foreclosures in the U.S., where home loans typically were interest-only and had terms of about five years. In 1933, to provide stability, the now-extinct Home Owners' Loan Corp. introduced a new type of mortgage: It had a fixed rate and was fully amortized, meaning borrowers paid off the entire loan by the end of the term. Not everyone cheered. Critics railed that it was "crazy and un-American [to be] putting people in debt for 15 years," says Louis Hyman, author of *Debtor Nation: The History of America in Red Ink*. The length of the loans grew even longer during the following decades, eventually stretching to 30 years. By 1960, 62 percent of U.S. households owned their own home, up from 44 percent in 1940.

Today many economists agree that the standard mortgage, with its predictable schedule of payments, is a welcome source of stability in household finances. As homeowners pay down a slice of their loan each month, they build up equity bit by bit. "The net worth of the middle class in this country is almost all home equity," notes Ellen Seidman, a senior fellow at the Urban Institute.

During the housing boom of the mid-2000s, lenders experimented with new flavors, such as loans with teaser rates that reset after a few years and ones with negative amortization, which meant the balance owed grew each month. As we all know, that didn't end well. The standard 30-year, fixed-rate mortgage has regained its prominence, accounting for 90 percent of all new home loans issued since 2010.

—Karen Weise

## 16. Shipping Container

**B 1956** The first container ship, the *SS Ideal-X*, carries 58 containers from Port Newark, N.J., to the Port of Houston.

The Federal Maritime Board established standard dimensions for containers in 1961: 8 feet high, 8 feet wide, and 10, 20, 30, or 40 feet long. Soon the containers were standardized to fit on trains and trucks, linking the three primary modes of transport for the first time. This eliminated one of the biggest costs of shipping: the bottleneck of unpacking and repacking cargo multiple times en route to its destination.

In 1956 hand-loading a ship cost \$5.86 a ton. Containers reduced that to about 16¢ a ton by cutting the number of man-hours needed to load ships. The introduction of the world's first crane designed specifically to lift containers, in 1959, meant that 400 tons could be loaded onto a ship in an hour—more than 40 times what a team of longshoremen could do.

During the era of the shipping container, world trade has grown by 700 percent. Until the 2008 recession, it had expanded for 50 consecutive years. —Matthew Philips





# 15.GPS

**1** **1983** President Reagan signs an executive order allowing civilian use of the Pentagon's Global Positioning System.

Korean Air Lines Flight 007 left Anchorage, Alaska, on Aug. 30, 1983, with 269 people on board, strayed into Soviet airspace on its way to Seoul, and was shot down by Russian forces. Part of Ronald Reagan's response was to allow civilian use of GPS, developed by the U.S. military in the 1970s as a Cold War weapon, to help planes avoid hostile airspace. Private businesses and scientists quickly realized that GPS receivers could help surveying and other industries, too.

In the early days, commercial GPS was much less accurate than the systems used by the military. GPS satellites work by sending out two signals: the course assignment signal, which locates a receiver to within about 100 meters, and the precise code, or p-code, which gives the exact location of a receiver. The military initially encrypted the p-code for fear that GPS would be a handy way for enemy militaries to guide weapons. By the mid-1990s, sophisticated GPS users had figured out ways to get around this encryption. The Clinton administration eventually chose to stop degrading the signals, deciding instead to focus on ways to shut GPS down in specific areas during times of war.

Once companies began making money on GPS, they plowed it into improving their equipment in ways the government hadn't foreseen, ultimately leading to the advent of Google Maps, turn-by-turn directions built into the dashboards of cars, and fitness-tracking services such as Strava and MapMyFitness. But the path from Reagan's decision to these consumer products is clear only in retrospect, says Jim Cantrell, chief executive officer of consultant Strategic Space Development. Cantrell used GPS to help track research balloons soon after Reagan's order. "Nobody I know of was talking about commercial applications back then," he says. "It's not like they flipped on the switch and everyone ran to it." —*Joshua Brustein*

## THINGS THAT ARE EASIER BECAUSE OF GPS

Finding friends and family via location apps

Cross-country skiing in the wilderness

Driving

Bass fishing

Getting to a bar everyone's at

Sending creepy advertisements

Synchronizing atomic clocks

## THINGS THAT ARE HARDER BECAUSE OF GPS

Avoiding friends and family

Keeping people out of your favorite backcountry skiing spot

Driving if your phone has died

Bass fishing without a damn computer

Discovering a bar no one's been to

Avoiding creepy advertisements

Having a convincing excuse for being late



# 14. THE CUBICLE

W 1968 Design firm Herman Miller introduces the Action Office II workspace.

Now seen chiefly as drab prisons for confining workers, cubicles were invented to do the opposite: liberate us from long, noisy, exposed rows of desks. The first successful model, the Action Office II, had partitions set at 120-degree angles to balance openness

and privacy, and encouraged movement. It was also a space hog. By the late '70s, stingy clients were demanding a smaller, more rigid workstation that they could use to cram more people into the same area. —Belinda Lanks

## A BEIGE WORLD OF WONDERS

Fans of the 1999 anticubicle masterpiece *Office Space* persuaded Swingline to officially release a red stapler, a key prop in the film, in 2002.

Total sales of *The 7 Habits of Highly Effective People*, king of the striver bookshelf: 25 million. Readers who subsequently got a corner office: significantly fewer.

One of the cubicle's few selling points: quiet. Australian researchers found in a 2013 study of 42,764 office workers that about half of those in open-plan layouts were unhappy with the lack of sound privacy.

Workers spend \$36.17 per week on lunch, according to consultants Accounting Principals. Half of those surveyed said the meal is their biggest workday expenditure—more than shopping, snacks, happy hours, and coffee combined.





Inventor Robert Propst became Herman Miller Research's president in 1960. "Today's office is a wasteland," a company bio quotes him saying at the time. "It saps vitality, blocks talent, frustrates accomplishment."

Cubicle culture and its comic touch points are universal. The *Dilbert* cartoon empire spans 2,000 newspapers in 65 countries and 25 languages.

Workers with no exposure to natural light sleep 46 fewer minutes each night, the *Journal of Clinical Sleep Medicine* said in 2014, and they have worse moods, cognitive function, and health.

"Physical well-being determines mental vitality and performance," trumpeted an early advertisement for the Action Office. "Control over interruption sustains accomplishment, for man is a creature of his environment."

The Aeron chair, part of the Museum of Modern Art's permanent collection, allows sitters to adjust the seat, arms, angle, tilt tension, lumbar depth, and more. Found in offices of all kinds, but principally an icon of Silicon Valley, it allowed countless 1999 startup founders to go bankrupt in comfort.

Propst imagined his fabric-covered wall dividers as personal pin boards for creative expression. It didn't work out that way.

Workers battling fatigue and afternoon ennui have helped turn the energy drink market into a roughly \$28 billion business.



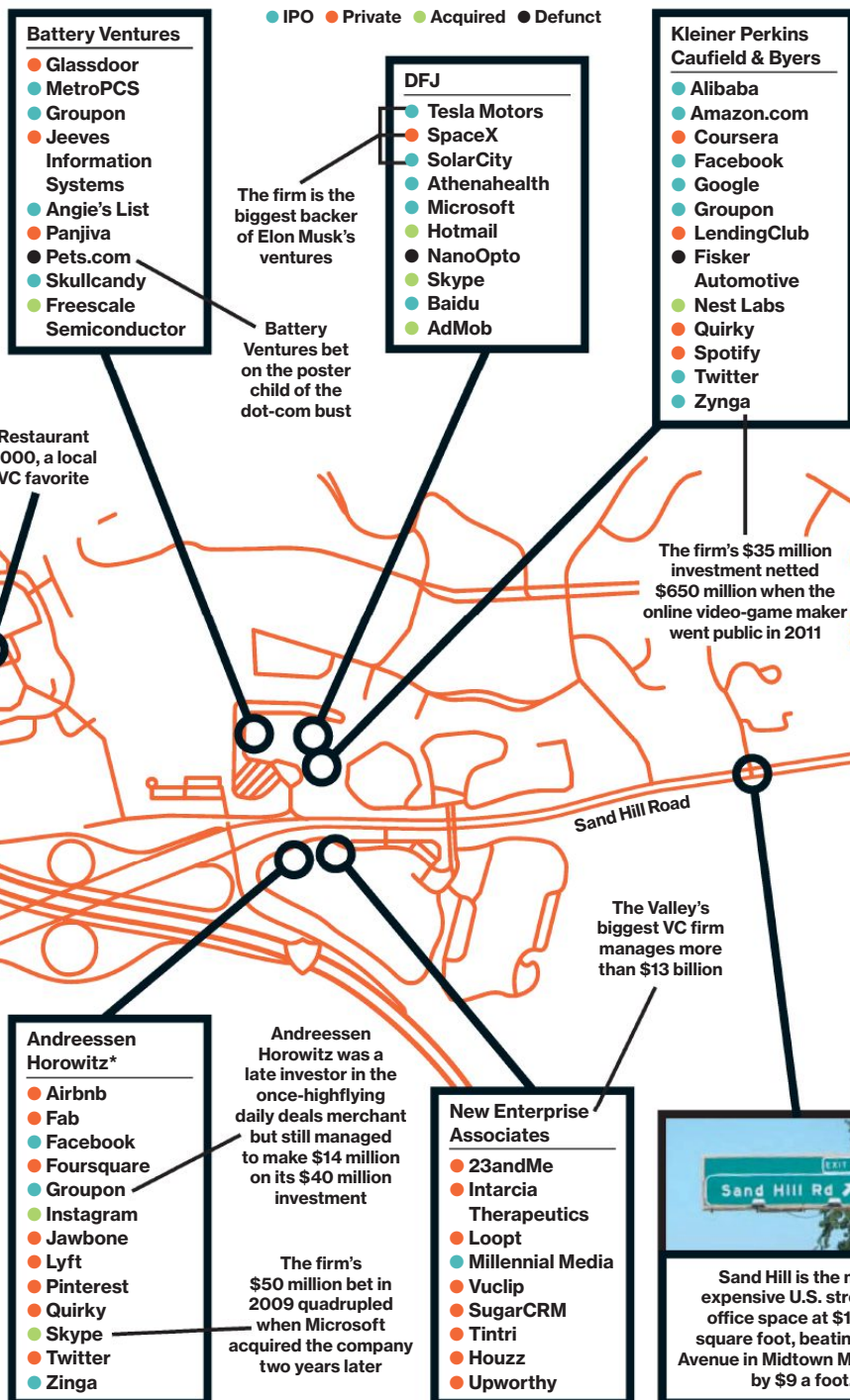
# 13.Venture Capital

**F 1946** Georges Frederic Doriot establishes the first institutional private equity investment firm, American Research and Development, to invest in businesses run by World War II veterans.

Sand Hill Road in Menlo Park, Calif., is synonymous with venture capital in the way Washington's K Street is with the lobbying industry. Since Kleiner Perkins Caufield & Byers became the first to hang its shingle in 1972, more than 20 other VC firms have set up headquarters there. Almost every prominent Silicon Valley company has received early-stage backing from one or more VCs on Sand Hill Road.

## HOLDINGS KEY

● IPO ● Private ● Acquired ● Defunct



# SILICON VALLEY

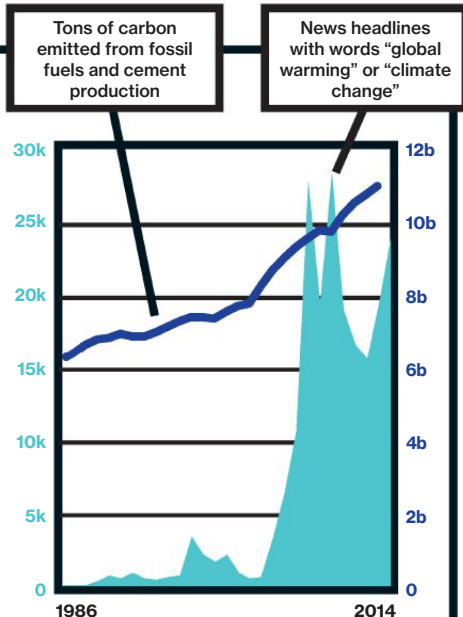
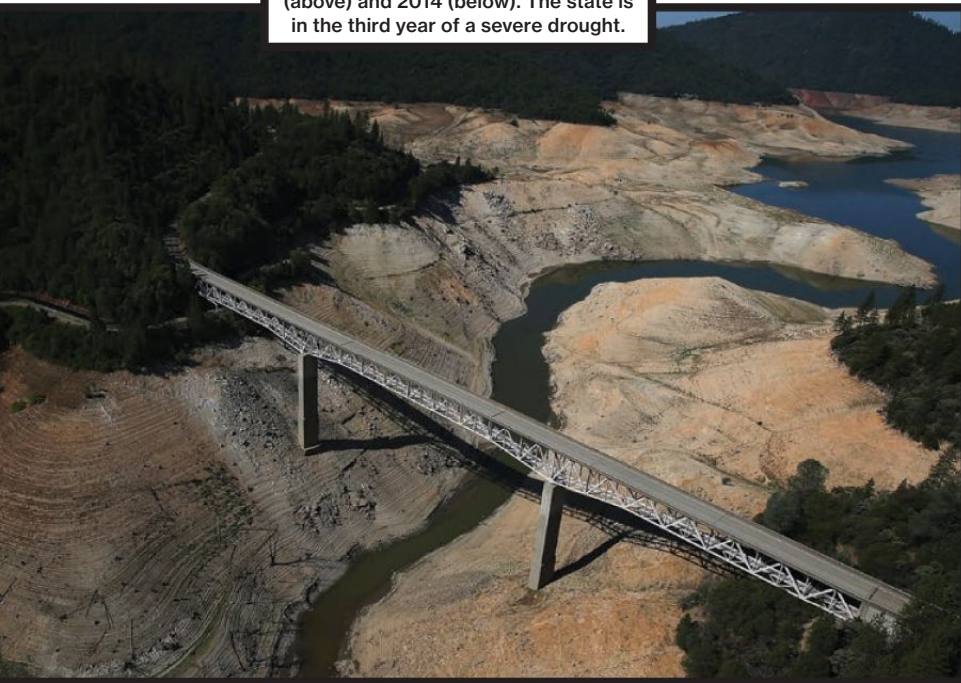
**P 1988** James Hansen, then director of NASA's Goddard Institute for Space Studies, introduces the idea of "global warming" to the public at a Senate hearing in Washington.

By James Hansen

I had testified several times during the 1980s without much effect, the immediately preceding testimony being in late 1987. After that, I met with the staffer who had arranged it and expressed the opinion that "global warming" was never going to get much attention if we kept scheduling the hearings in cold seasons. The next hearing was in the summer. By luck it was exceedingly hot, above 100 degrees in Washington. I came to D.C. the evening before. As usual, I was a little slow and did not finish preparing my oral remarks, because I was listening to a Yankee game. At a meeting on the morning of June 23 at NASA Headquarters, I was feverishly preparing my oral testimony when the chairman of the meeting said, "No respectable scientist would say that human-made climate effects are already occurring and detectable." That caused me to look up suddenly and say, "I



California's Lake Oroville in 2011 (above) and 2014 (below). The state is in the third year of a severe drought.



extremes of the hydrologic cycle. Evaporation, and therefore precipitation, must increase on average, but the precipitation will tend to come in more extreme events, thus resulting in more extreme floods, the historical “hundred-year floods,” occurring more often than once a century. I testified once more, in 1989, and that got attention when I revealed that my testimony had been altered by the White House Office of Management and Budget. Then I bailed out of public appearances for 15 years.

It was not until after the frustrations of the first term of George W. Bush and Dick Cheney that I decided to speak out publicly. Near the end of 2004, I gave a talk recommending that people vote for John Kerry. Then I gave an improved version of the talk at the American Geophysical Union in 2005, which resulted in attempts to censor my speaking. That was when I explained to *60 Minutes* that I did not want my grandchildren to say, “Opa understood what was happening but didn’t make it clear.” —As told to Brad Wieners

don’t know if he’s respectable or not, but I know a scientist who is about to make that assertion.”

At lunchtime, I left the NASA meeting and took a taxi to the Senate. I immediately realized that the public would misinterpret my testimony as meaning that every year would be warm, so I made up some colored dice to illustrate that I was only saying that the climate dice were now “loaded” because of human-made greenhouse gases. I also realized that the public might think that global warming meant continued and expanding droughts. I decided that I should testify once more to try to make the point that global warming pumps up both

# WARMING





# 11. Al-Qaeda

● 1988 Al-Qaeda is formed in Peshawar, Pakistan.

By Steve Coll

On Nov. 1, 1996, through an office he maintained in London, Osama bin Laden bought an Inmarsat Mini-M satellite telephone, one of the first global telephones. It looked like a laptop and retailed for about \$15,000. Associates ferried it to Kandahar, where bin Laden had recently taken shelter with the Taliban. During the next two years he made more than 900 satellite calls to Britain, Pakistan, Saudi Arabia, the U.S., Yemen, and even a ship sailing in the Indian Ocean. By satellite phone, bin Laden organized suicide truck bombings on U.S. embassies in Nairobi, Kenya, and Dar es Salaam, Tanzania, in the summer of 1998, attacks that killed more than 200 people and announced al-Qaeda as the modern world's deadliest practitioner of cross-border terrorism.

From its origins, al-Qaeda transcended categories. The group's leaders, bin Laden first and foremost, believed their actions were ordained by God and would be vindicated in the afterlife. To the extent that al-Qaeda articulated a vision of political economy, it called for the imitation of life in seventh century Arabia. Yet bin Laden, who studied business administration as an undergraduate and whose family members owned Hard Rock Cafe and Porsche franchises, was at the same time a terrorism modernizer. More than any obscurantist of his generation, he exploited globalization—satellite communication, jet travel across open borders, and new media. In the annals of terrorism, bin Laden proved much more disruptive as a communicator and a brand builder than as an ideologist.

Al-Qaeda's founder grew up in an upper-middle-class home in Jeddah, Saudi Arabia. On television he watched *Bonanza* and international news broadcasts. Like many young Arabs of his generation, he was influenced by the televised violence and hijackings staged by secular Palestinian terrorists. On July 22, 1968, when bin Laden was 10, the Popular Front for the Liberation of Palestine hijacked an El Al Israel Airlines flight and ordered it flown to Algeria, where its crew and five passengers were held prisoner for more than a month. The attack modeled terrorist assaults on commercial aviation as a strategy for small groups of violent radicals. "At least the world is talking about us now," said George Habash, the PFLP's founder.

Bin Laden joined the Muslim Brotherhood as a high school student. In his 20s he volunteered in Afghanistan's revolt against Soviet occupation. In the context of Saudi Arabian religious culture and foreign policy, bin Laden's choices were orthodox rather than radical, comparable to a Christian American youth's decision to spend summers building houses in Africa. His sophistication about the disruptive potential of cross-border telephony and media arose from his place in a successful, highly conventional Arabian business family that marketed Western brands in Saudi Arabia and even owned early equity in Iridium, the pioneering if overambitious satellite phone innovator.

In the summer of 1988 in Peshawar, after years of exposure to the Afghan jihad and in the company of exiled

Egyptian Islamists, bin Laden helped to found al-Qaeda and accepted the position of emir. (He was probably nominated for the position because he alone had a bank account that could fund the enterprise.) Al-Qaeda aspired to be a vanguard of preordained worldwide Islamic revolution, one designed to reestablish an Islamic caliphate and hasten Judgment Day. As a means to that end, the group's founders pledged in essence to do to the U.S. and allied secular governments in the Arab world what Afghan jihadis had done to the Soviet Union.

In its early years, al-Qaeda fragmented. After Soviet troops left Afghanistan, that war descended into intramural ethnic conflict among Muslims. Bin Laden returned to Saudi Arabia. He agitated against King Fahd, accusing him of corruption. Soon he found himself in exile again, in Khartoum, Sudan, this time as a true dissident and a black sheep of his prominent family. It was by denouncing the legitimacy of his native Saudi Arabia that he passed from pious-but-conventional youth to most wanted radical.

He hoped now to mobilize international revolt. Al-Qaeda's first innovative tool became the fax machine. From Khartoum, bin Laden faxed subversive manifestoes to clandestine sympathizers in Saudi Arabia. His was an early example of a transnational network of like-minded subversives, consolidated through early forms of unofficial social media.

In May 1996, Sudan expelled bin Laden to Afghanistan. There he penned a furious, rambling declaration of war against the U.S. Bin Laden's threats might have passed unnoticed but for two factors. First, he invited reporters from Al Jazeera, then a nascent satellite news channel, to interview him. These segments allowed him to beam his incendiary messages over the information barriers erected by Arab police states directly into the satellite dish-equipped homes of Arabic-language media consumers. Second, as bin Laden contemplated spectacular violence against the U.S., he enlisted a Hollywood-inspired Pakistani planner, Khalid Sheikh Mohammed, to help him think big. In conceiving the Sept. 11 attacks, bin Laden also clearly drew on the Palestinian examples of his youth.

After 2001, al-Qaeda saw its communication innovations overtaken by successors and competitors. For a while, despite the emir's old-school proclivities, al-Qaeda innovated through the Internet by seeking to inspire and train scattered adherents virtually. But the group would lose influence to successors such as Anwar al-Awlaki, the leader of al-Qaeda in the Arabian Peninsula, and more recently Islamic State. They exploited digital media more fully while bin Laden hid in a house without electricity in Abbottabad, Pakistan, and wrote messages to colleagues by hand.

Islamic State's Twitter and YouTube-enabled communications follow the same border-hopping asymmetric strategy that bin Laden pioneered with satellites. Its messages offer promises of righteous government within a new state, something al-Qaeda never delivered. Islamic State is to al-Qaeda what Facebook was to Myspace: a successor that took a successful but short-lived model and adapted it for a new generation.



# 10.APPLE

**T 1976** The Apple I computer goes on sale for a retail price of \$666.66.

Steve Wozniak, who co-founded Apple with Steve Jobs and designed the company's first product, the Apple I, remembers the early days. —*Brandon Lisy*

**You said you saw a revolution coming. Do you think Steve Jobs did?**

He had always spoken about wanting to be a person that moves the world forward, but he couldn't really create things and design them like I could. Steve wanted a company real badly. His thinking was not necessarily about what computers would do for the average Joe in the average home. Steve found the words that explained what these computers would do for people and how important it was a little later in life.

**Talk a little bit about the summer you built the Apple I.**

I was totally aware that a revolution was close to starting, that pretty soon we were going to have computers that were affordable. Every computer before the Apple I looked like—you have to imagine the most awful, not understandable computer you've ever seen in a museum or in a new movie. That's what they all looked like. They had these big front panels of metal switches and lights and stuff, and nobody could understand them except a computer expert. The Apple I was the first one to have a keyboard and a video display. A television. You would type on the keyboard and see your words on the television, or the computer could type its own words on the television and play games with you and ask questions and give answers. That was a turning point in history.

**You mentioned you didn't like conflict. Did Steve like conflict?**

Steve was going to make sure that his position was strong and forceful and heard by others. Thankfully he had the best brain. He usually had a little, tiny suggestion, but almost always he was right.

**And where were you doing all this work?**

The work was being done—soldering things together, putting the chips together, designing them, drawing them on drafting tables—at my cubicle at Hewlett-Packard in Cupertino [Calif.]. That was an incredible time. It let me do a lot of side projects, and it was five years to the summer of '75, when I built the Apple computer, the first one. The next summer I built the Apple II computer.

**How many computers did you sell?**

We only sold about a hundred Apple I's. Of the Apple II's, we probably sold a few thousand through the first year. And then [we designed] a spreadsheet program that let small businessmen do more work in one hour than they could do in 10 years with pencil and paper. Sales shot up. It was maybe five years before we sold a million—the first computer ever to sell a million.

**Did you think Apple would become a behemoth?**

When we started the company, I knew that the computer was so far ahead of anything the rest of the world had ever seen. We knew we had a revolution. Everyone who joined Apple, this was the greatest thing in their life.

**We always hear about the garage. Is that a big part of the story?**

The garage is a bit of a myth. We did no designs there, no breadboarding, no prototyping, no planning of products. We did no manufacturing there. The garage didn't serve much purpose, except it was something for us to feel was our home. We had no money. You have to work out of your home when you have no money.



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# 9. The Pill



📅 **1960** Enovid is approved by the U.S. Food and Drug Administration as the first oral contraceptive.

Five years after the introduction of the pill, 41 percent of “contracepting” women had a prescription, according to *The Power of the Pill*, a 2002 analysis by Harvard economists Claudia Goldin and Lawrence Katz. Today, four out of every five sexually active women in the U.S. have taken oral contraceptives at some point in their lives. As birth control became widely available, women began delaying marriage and investing in their education without fear of pregnancy or commitment to abstinence, which led to higher female employment rates and better careers. As of 2011, when the U.S. Department of Labor last released data, more than half of employed women worked in skilled professions. While factors such as feminism and antisexism laws also helped, the Harvard study found that the pill has had a singularly profound effect in advancing women’s economic freedom. —*Kurt Soller*

Share of  
U.S. working women  
in management  
or professional  
occupations

1970

**19.9%**

1980

**27.4%**

2000

**37.5%**

2011

**51%**

DATA: INTEGRATED PUBLIC USE MICRODATA SERIES,  
U.S. DEPARTMENT OF LABOR

COURTESY MARC ST. CIL/NATIONAL ARCHIVES



# 8. THE MANHATTAN PROJECT

**P 1941** Franklin Roosevelt approves the creation of a secret program aimed at developing an atomic bomb.

Even before it entered World War II, the U.S. was racing to create the weapon that would end the war. In 1939, Albert Einstein sent a letter to President Roosevelt informing him that “it may become possible to set up a nuclear chain reaction in a large mass of uranium” and that, using this technology, “it is conceivable—though much less certain—

that extremely powerful bombs of a new type may thus be constructed.” Einstein told FDR that Nazi Germany had already begun research, making it urgent that the U.S. start its own atomic program. Originally headed by a team in New York of U.S. Army scientists, later called the Manhattan Engineer District, the project would employ hundreds of thousands of workers in 27 sites across the U.S. and Canada. The dropping of atomic bombs on the Japanese cities of Hiroshima and Nagasaki in August 1945

caused the deaths of an estimated 185,000 and hastened Japan’s decision to surrender. It also signaled the dawn of the nuclear age and the proliferation of weapons more destructive than what the creators of the bomb could have foreseen. Shortly before his death in 1955, Einstein told chemist Linus Pauling, “I made one great mistake in my life ... when I signed the letter to President Roosevelt recommending that atom bombs be made.” — *Romesh Ratnesar and Evan Applegate*

**1942-46:  
THE PROJECT**

**500,000**

people worked on the project at its peak, lathing out radioactive metals or hashing out theoretical physics in the desert.

**27**

facilities across the U.S. and Canada housed the work. Mines, uranium processing plants, and research centers were constructed at breakneck speed.

**\$28.6 billion**

cost, in 2014 dollars

**14,700 tons**

or \$2.7 billion worth of silver was borrowed from the Treasury to use in electromagnets.

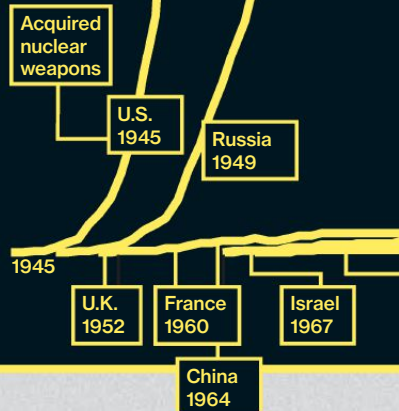
**2014: THE FALLOUT**

**\$872 billion**

estimated cost of maintaining the U.S. nuclear arsenal over the next 30 years

Bombers, submarines, land-based ICBMs	\$240b
New warheads, maintaining old ones	\$350b
Command, control, and communications	\$120b
Minuteman missile upgrades	\$20b
Long-range standoff missiles	\$10b
Ohio-class ballistic missile submarines	\$77b
Long-range strike bombers	\$55b

**Stockpiled warheads**



Anyone who worked on the project for more than a year received this pin



Working on the bomb at Los Alamos, N.M., in 1945



194 PERCENT  
Increase in  
corporate debt in  
the U.S., 1980-90

## 7. Junk Bonds

**F 1989** Kohlberg Kravis Roberts uses junk bonds to finance its \$26 billion hostile takeover of RJR Nabisco.

By Michael Milken

In our years on Wall Street, my colleagues and I developed more than a dozen securities types at all levels of the capital structure to help thousands of entrepreneurs grow their businesses and create jobs. High-yield bonds—which some started calling “junk” in the 1970s—were often part of the mix but rarely the entire story. Although junk bonds have produced better long-term returns than almost any other asset class, they’re not always the right way to finance a growing company. Success through good times and bad depends on building a strong capital structure that limits risk where business conditions are volatile.

In industries with predictable and stable revenue, higher levels of debt may be appropriate. But other businesses, such as technology, should finance growth primarily with equity. Getting the right balance requires deep understanding of social and regulatory trends, management competence, industry conditions, capital markets cycles, and the economy.

My study of these complex dynamics began in 1965 when I was an

undergraduate at the University of California at Berkeley. Scanning the financial tables of a widely overlooked book, W. Braddock Hickman’s *Corporate Bond Quality and Investor Experience*, I was struck by the disparity between theory and reality. The prevailing theory—that markets accurately adjust yield to compensate for higher risk—was clearly wrong. Hickman’s survey of yields and defaults from 1900 to 1943 concluded that investors usually overestimated risk in higher-yielding bonds.

After studying capital structure at Wharton, I joined Wall Street’s leading research firm in 1969. At the time, most analysis focused solely on the past, primarily book value and reported earnings. But my experience showed that through rigorous research and a sharper focus on future cash flow, we could price and reward investment risk more precisely. The proof came in 1974, when companies with the right capital structure prevailed despite a doubling of interest rates, a stock market crash, and a severe recession.

Effective use of high-yield bonds had been an important economic vehicle even before Alexander Hamilton used them to finance America’s Revolutionary War debt. In the 19th century, European investors bought the junk bonds that built America’s railroads and other ►



◀ major industries. By the 20th century, three types of capital—human, social, and financial—had become closely intertwined. Without social capital—universal education, for example—human capital can't develop. Without human capital—skilled people—financial capital can't be deployed productively.

These relationships can be stated in an equation that I first developed half a century ago:  $P = Ft (HC+SC+RA)$ . Prosperity equals the effect of financial technology acting to multiply the value of human capital, social capital, and real assets.

“Financial technology” includes innovative processes and components such as convertible bonds, preferred stock, high-yield bonds, collateralized loans, equity-linked instruments, securitized obligations, and derivatives. “Human capital” is the collective talent, training, and experience of people. “Social capital” includes, among other concepts, the rule of law, property rights, education, public health, and transparent markets. “Real assets” are tangible items on the balance sheet.

This “prosperity formula” has stood the test of time. Stable economic growth most often occurs where people have access to education and health care, can participate freely in the political process, and can aspire to property ownership. The formula remains my core understanding of the relationship between finance and a strong society.

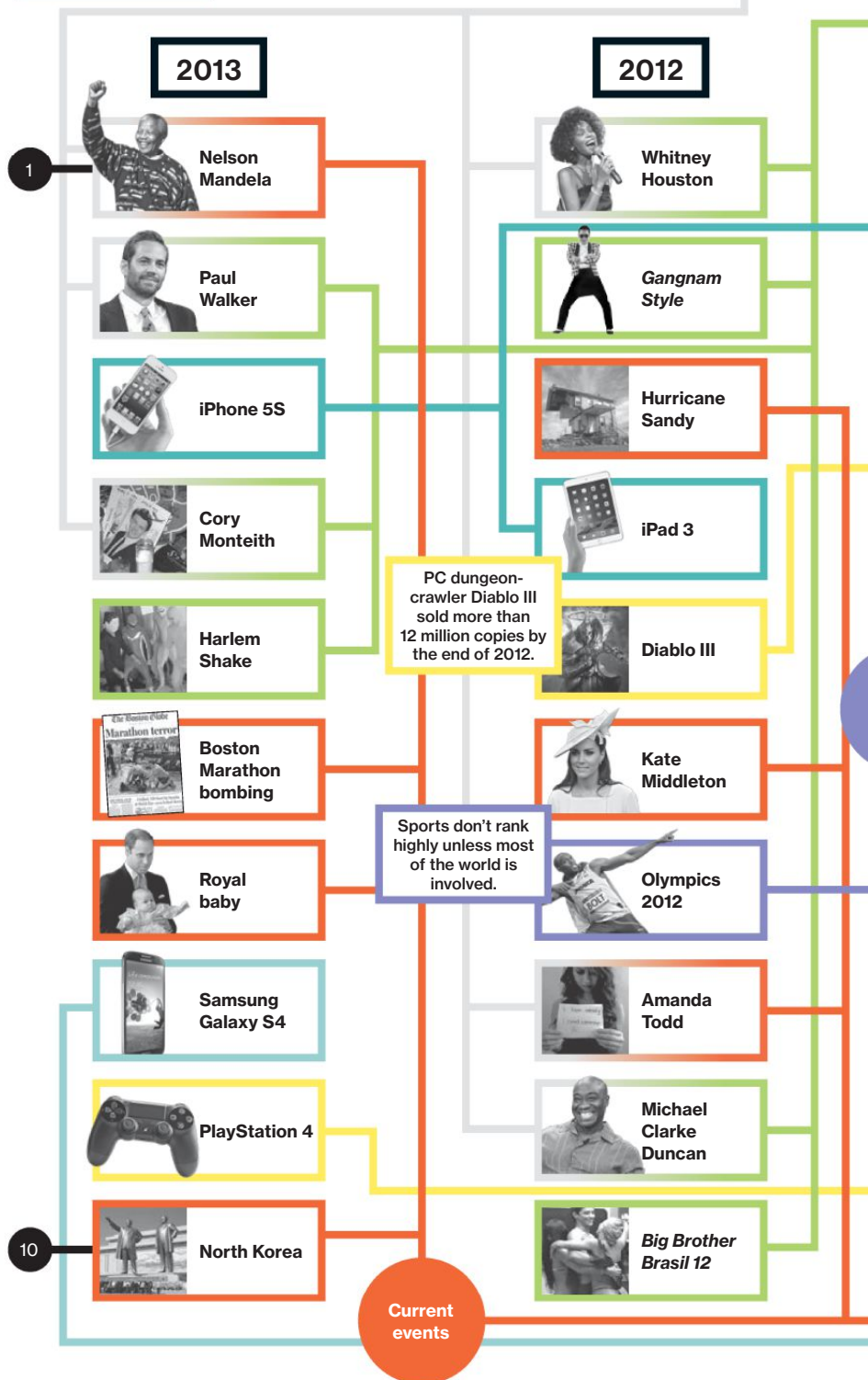
As late as the 1960s, access to financial capital was controlled by relatively few bankers who dispensed it to privileged clients—a few hundred corporations with an investment-grade rating. Such companies, whose managements were almost all male, white, and part of the Establishment, were considered safe. This institutionalized the denial of capital to many entrepreneurs with great business ideas. Among its victims were minorities and women.

Financial technology, including the prudent use of non-investment-grade debt and many other securities types, helped right that wrong. In the 1970s public and private markets started to replace banks and insurance companies as the main capital source. The results were revolutionary: From 1970 to 2000, these “junk” companies created 62 million net new jobs in America even as the large “investment-grade” businesses contracted by 4 million employees. The growing flexibility of the capital markets allowed many companies to recapitalize during the most recent economic downturn, proving once again that capital structure matters.

# 6. GOOGLE

## TOP TRENDING GLOBAL SEARCHES

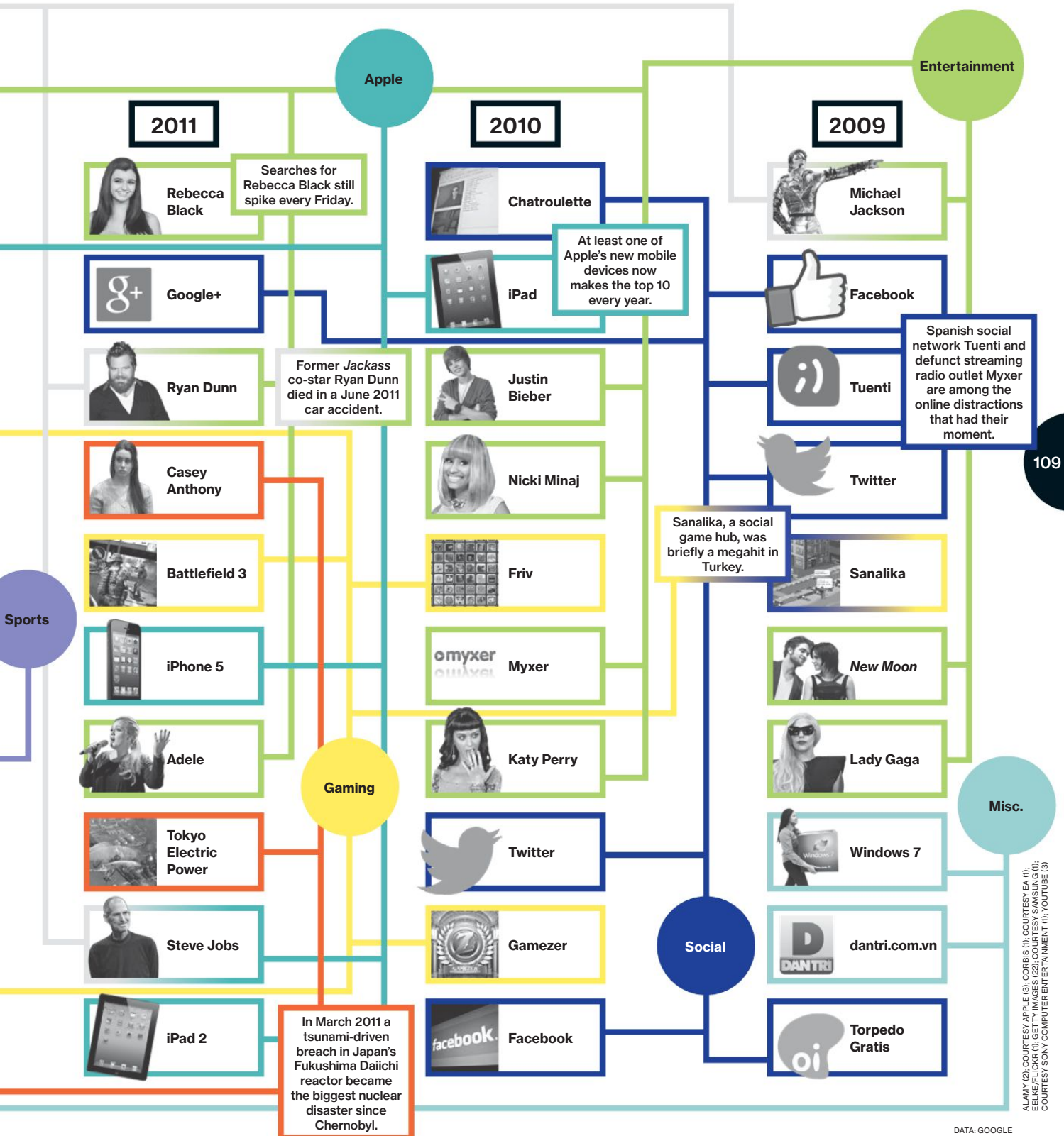
Deaths



**1998** Larry Page and Sergey Brin develop a search engine that ranks Web pages based on how many other pages link to them.

Google was founded with a soaring mission: to organize the world's information in a universally accessible and useful format. Over the past 16 years, as it's grown from a research paper to a market valuation of \$370 billion, Google has held up a mirror

to humanity, and the reflection has been revealing—occasionally inspiring, often frightening. The company says people now use Google in lieu of Internet addresses, so the most common terms people type in are things like “ebay” or “amazon.” To get a truer sense of what the world is wondering, Google nets out those URL-replacement terms to track the top trending searches each year. This year the early winner appears to be “ebola.” —Brad Stone





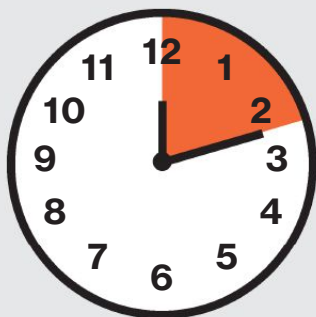
# 5.TV

**M 1934** Philo Farnsworth stages the first public demonstration of an all-electronic television system at Philadelphia's Franklin Institute.

## HOW MUCH DOES THE AVERAGE AMERICAN WATCH?

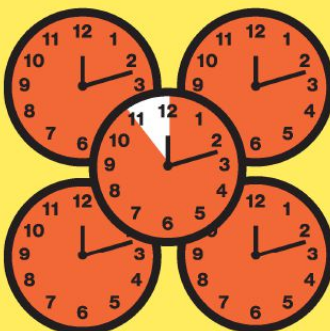
### Per hour

18 seconds



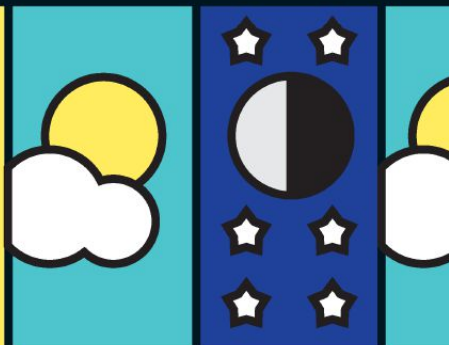
12 minutes

### Per day



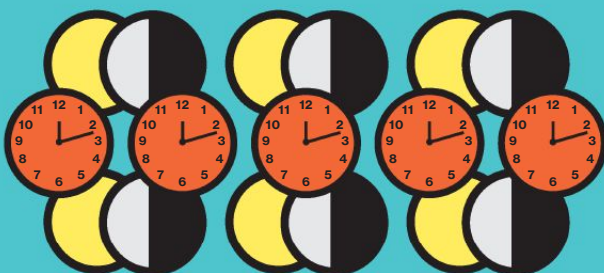
4 hours, 55 minutes

### Per week



1 day, 10 hours, 27 minutes

### Per month



6 days, 5 hours, 17 minutes

### Per year



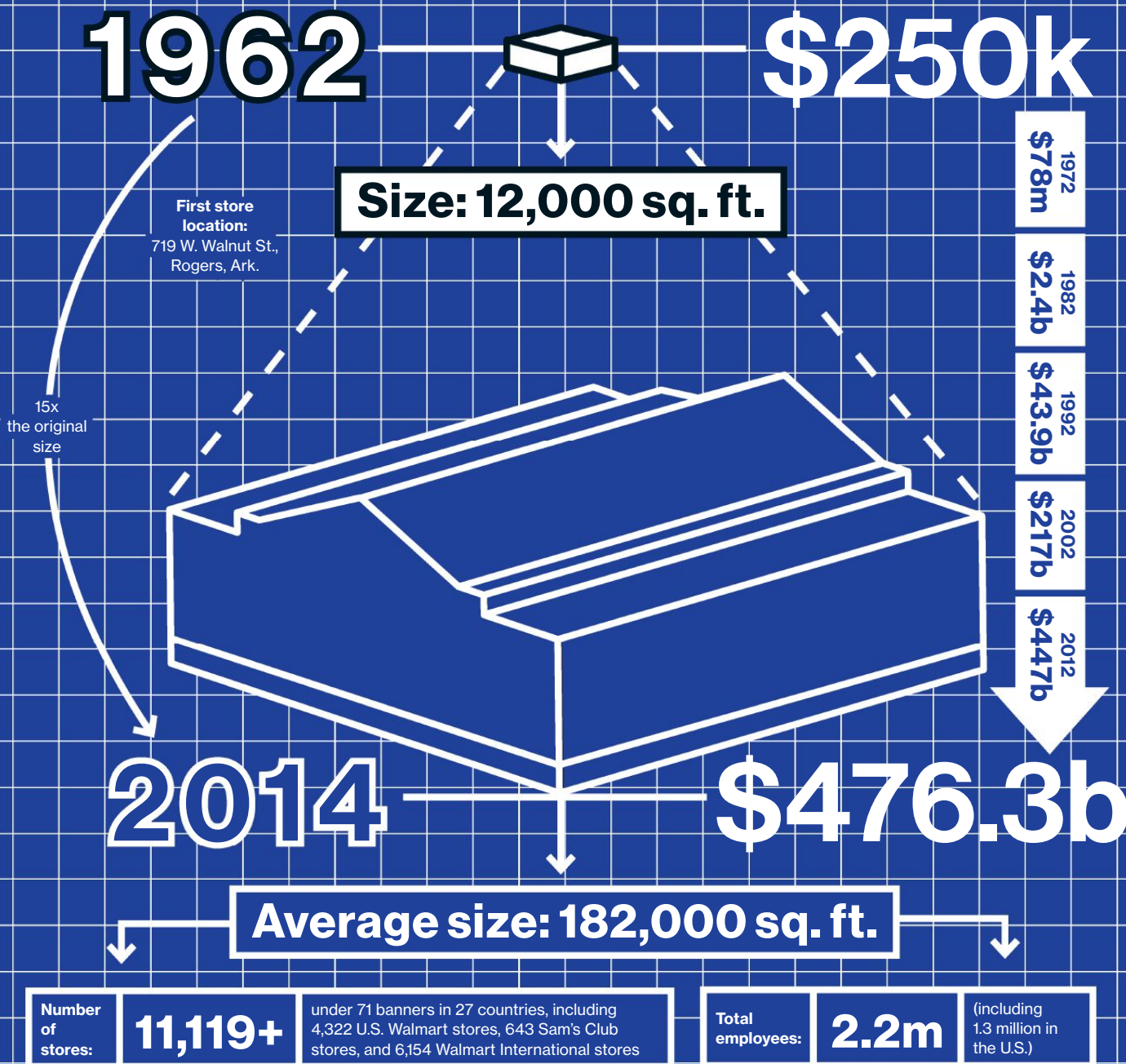
2 months, 12 days, 15 hours, 29 minutes

### Per lifetime



16 years, 1 month, 9 days, 1 hour, 21 minutes





# 4. WAL-MART

**B** 1962 Sam Walton opens the first Walmart store.

We pay less for toothpaste, dog food, blankets, and thousands of other everyday items because of Walton. Wal-Mart Stores wasn't the first discount retailer, but it was the most relentless when it came to keeping prices low. In 1980, Wal-Mart's sales reached \$1 billion. By 1993 the company was selling \$1 billion worth of goods every week. Walton didn't let his executives spend a lot—they shared hotel rooms on trips. He didn't pay his suppliers as much as they were used to, either. Some U.S.

companies moved production to China to keep their costs down. Wal-Mart says extracting lower prices from its suppliers is good for its customers. A study commissioned by the company concluded that U.S. families who shopped at Wal-Mart saved on average \$2,329 in 2005. Although the accuracy of that figure is debatable, research by independent economists has indicated that Wal-Mart's colonization of the U.S. has had a beneficial effect on inflation: Competing retailers tend to lower their prices when one of the company's big-box stores opens nearby. —Susan Berfield



# 3.Green Revolution

**P 1965** Disease-resistant wheat seeds developed by Norman Borlaug are introduced in India and Pakistan.

Far more than politicians or pop stars, biologists are responsible for the world's success in reducing hunger. In the 1960s, Borlaug and an international community of scientists developed high-yielding strains of rice and wheat that were distributed to farmers in poor nations. The innovations helped avert famine

in South Asia, saving hundreds of millions of people and setting the stage for India's development. A simple formula has since fed the world: Lots of fertilizer, water, and pesticides added to high-yield seeds equals a full pantry. Environmental harm and fragile single-crop agricultural systems followed from the new techniques, but those effects must be weighed against the millions who would have perished if Borlaug's ideas hadn't taken root. —*Evan Applegate*





## CHANGE IN CROP YIELDS ACROSS THE DEVELOPING WORLD\*

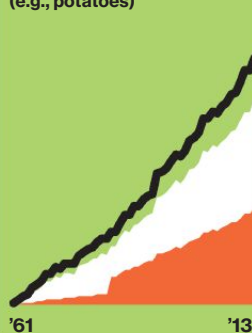
■ Share of growth because of increased use of irrigation, fertilizer, and pesticides  
■ Share of growth because of improved crop varieties

200%  
150%  
100%  
50%  
0%

Cereals  
(e.g., wheat,  
corn, rice)

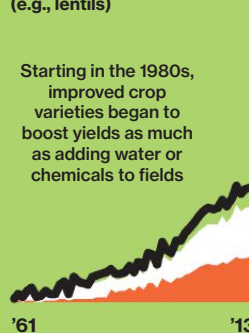


Roots, tubers  
(e.g., potatoes)



Pulses  
(e.g., lentils)

Starting in the 1980s, improved crop varieties began to boost yields as much as adding water or chemicals to fields



## WHAT IF IT HAD NEVER HAPPENED?

Yields in the developing world would be **17 percent lower**.

**37 million** more children would be malnourished.

People in developing nations would consume **13 percent fewer calories**.

An area the size of **Oregon** would need to be cleared for farming to maintain current food production levels.



Rice fields in the Indian state of Jammu and Kashmir



## 2.MICROCHIPS

**1** **1947** Researchers at Bell Labs invent the transistor, the critical first step toward development of the microchip.

**By Walter Isaacson**

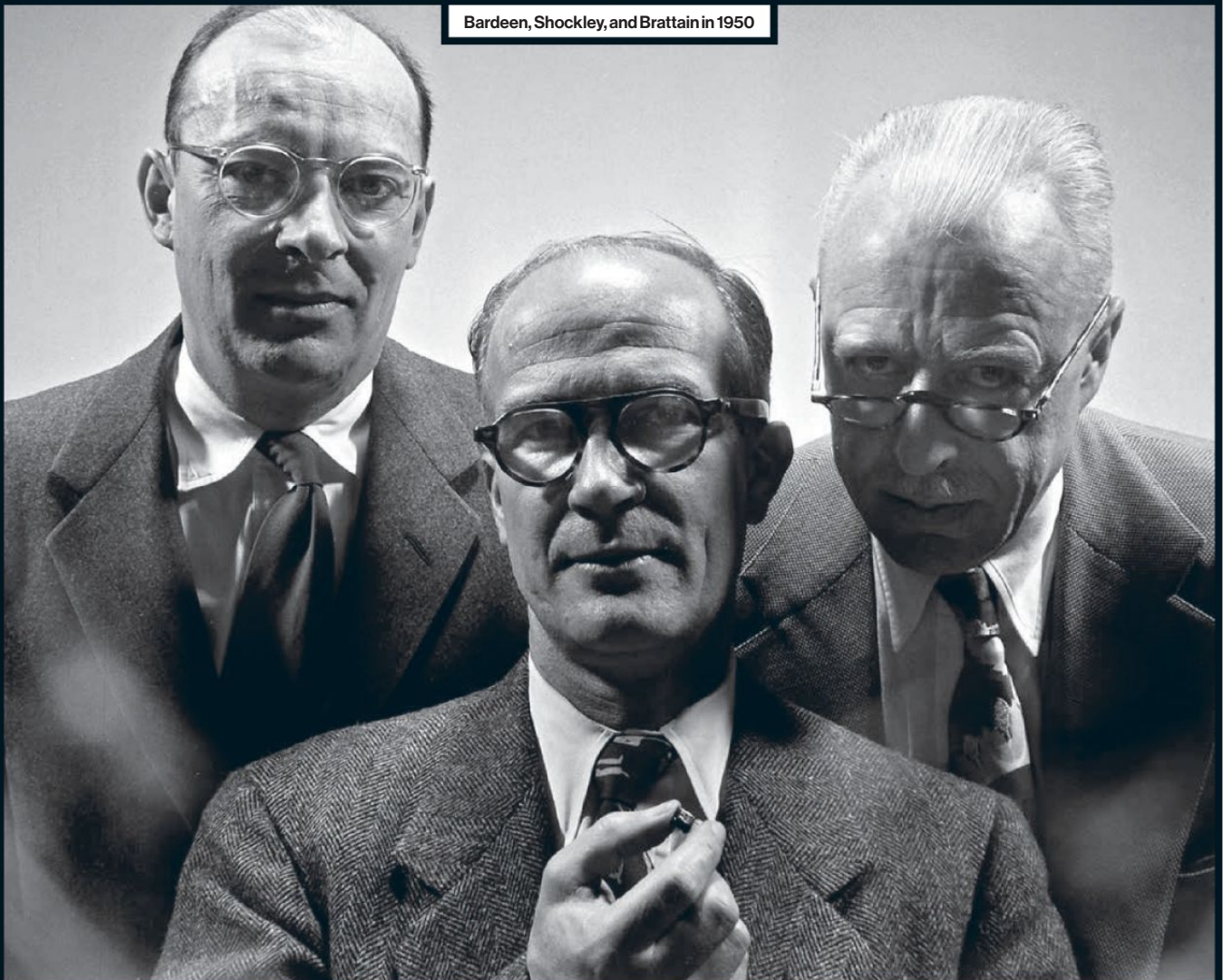
The Digital Revolution was spawned in Murray Hill, N.J., shortly after lunchtime on Tuesday, Dec. 16, 1947. Scientists at Bell Labs succeeded that day in putting together a tiny contraption that they had concocted from strips of gold foil, a chip of semiconducting material, and a bent paper clip. When wiggled just right, it could amplify an electric current and switch it on and off. The transistor, as the device was soon named, and the ability to etch millions of them onto microchips became to the Digital Age what the steam engine had been to the Industrial Revolution.

Three colleagues would go down in history as the inventors of the transistor: a deft experimentalist named Walter Brattain, a quantum theorist named John Bardeen, and a solid-state physics expert named William Shockley. But there was another

player in this drama that was as important as any individual: Bell Labs, where these men worked. The transistor required a team that threw together theorists who had an intuitive feel for quantum phenomena with material scientists who were adroit at baking impurities into silicon. In Bell Labs' long corridors, designed to encourage serendipitous encounters, an information theorist named Claude Shannon rode a unicycle and juggled balls as he shared ideas with ingenious metallurgists, engineers, physicists, and even a few AT&T pole climbers with grease under their fingernails.

The need to combine theorists with engineers was particularly essential in a field known as solid-state physics, the study of how electrons flow through solid materials. In the 1940s, Bell Labs engineers were tinkering with materials such as silicon to juice them into performing electronic tricks. At the same time, Bell theorists were wrestling with the mind-bending realm of quantum mechanics, which is based on the model of atomic structure in which electrons orbit around a nucleus at specific levels. Electrons could make a quantum leap from one level to the next but never be

Bardeen, Shockley, and Brattain in 1950



in between. Their number in the outer orbital level helped to determine how well an element conducted electricity.

Some elements, e.g., copper, are good conductors. Others, such as sulfur, resist electrical current. And then there are those in between—the semiconductors, like silicon and germanium. What makes semiconductors useful is that they can be easily manipulated to become better conductors. For example, if you contaminate silicon with a tiny amount of arsenic or boron, its electrons become more free to move.

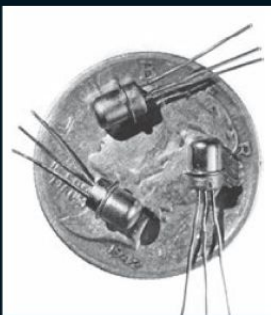
The mission of the solid-state team at Bell Labs was to find a solid, simple, and sturdy device that could replace the unwieldy vacuum tubes that still powered electronic computers. Its leader was Shockley, who had the ability to visualize the movement of electrons the way a choreographer can visualize a dance. He developed a theory that if an electrical field were placed right next to a slab of semiconducting material, it would pull some electrons to the surface and permit a surge of current through the slab. Thus a semiconductor might be used as an amplifier or an on-off switch, just like a vacuum tube.

The theorist Bardeen and experimentalist Brattain shared a workspace, like a librettist and a composer sharing a piano bench, so they could perform a call-and-response all day about how to manipulate silicon and germanium to make such a device. Their work culminated in late 1947, when they devised ways to deal with a shield that formed in what was called the “surface state” of the semiconductor. They realized that the best way to overcome this problem was to jab two metal points into the silicon or germanium really close together. Bardeen calculated that the points should be less than two-thousandths of an inch apart. That was a challenge, even for Brattain. But he came up with a clever method: He glued a piece of gold foil onto a small plastic wedge shaped like an arrowhead, then used a razor blade to cut a slit in the foil at the tip, forming two gold contact points close together.

When Brattain and Bardeen tried it on the afternoon of Dec. 16, something amazing happened: The contraption worked. “I found if I wiggled it just right,” Brattain recalled, “I had an amplifier with the order of magnitude of 100 amplification.” On his way home that evening, the voluble Brattain told the others in his carpool he had just done “the most important experiment that I’d ever do in my life.” When the less talkative Bardeen got home, he told his wife about something that happened at the office. It was only a sentence. As she was peeling carrots at the kitchen sink, he mumbled quietly, “We discovered something important today.”

There was a limit to how useful the transistor could be, however. Any powerful logical circuit would require stringing together millions of them. In a paper published in the fall of 1957 to celebrate the 10th anniversary of the transistor, a Bell Labs executive dubbed this problem “the tyranny of numbers.” As the components in a circuit increased, the number of connections increased much faster. If a system had 10,000 components, that might require 100,000 or more little wire links on the circuit boards, some soldered by hand. This was not a recipe for reliability.

Two important events happened just when the paper was published. The company that Shockley founded to make transistors disintegrated because of his increasingly erratic personality, and some of his best engineers—including Robert Noyce and Gordon Moore—split off to start a company called



In 1956, three transistors could fit on a dime

Fairchild Semiconductor (they later formed Intel). Then on Oct. 4, the Russians launched Sputnik, a satellite that orbited the earth, and set off a space race with the U.S. Because computers had to be made small enough to fit into a rocket’s nose cone, it was imperative to find ways to cram thousands of transistors into tiny devices.

The stage was thus set for the innovation that would make transistors not merely useful but historically transformative: the integrated circuit, also known as the microchip. It happened almost simultaneously in two different places.

The first was a Dallas-based oil exploration company that had changed its mission and renamed itself Texas Instruments. A few months after Sputnik, it hired an engineer named Jack Kilby, who was working at a company that made hearing aids and who had taken a course at Bell Labs on how to use transistors. The policy at Texas Instruments was for everyone to take off the same two weeks in July, but Kilby had accrued no vacation time in 1958, so he found himself alone in the lab. This gave him time to think about what could be done with silicon other than fabricate it into transistors.

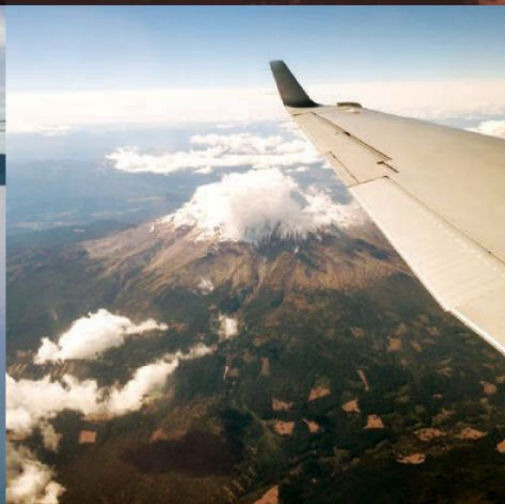
He knew that if he created a bit of silicon without any impurities, it would act as a resistor. There was also a way, he realized, to make a piece of silicon act as a capacitor, meaning it could store a small electrical charge. You could make any electronic component out of differently treated silicon—in fact, you could put them all on one piece of silicon.

Meanwhile, Noyce and his Fairchild colleagues discovered that their transistors were not working very well. A tiny piece of dust, or even exposure to some gases, could cause them to fizzle.

A Fairchild engineer named Jean Hoerni came up with an ingenious fix. On the surface of a silicon transistor he would place a thin layer of silicon oxide, like icing atop a cake, that would protect the silicon below. He soon realized that tiny windows could be engraved in this protective layer to allow impurities to be diffused at precise spots. That way, different types of transistors and other components could be etched on a single chip of silicon. Instead of cumbersome copper wires connecting the components, Noyce proposed that tiny copper lines be laid down onto the silicon to integrate complex circuits on the chip. He and his team had come up with the concept of a microchip independently of, and a few months later than, Kilby.

There is an inspiring lesson in how Kilby and Noyce personally handled the question of who invented the microchip. Both came from tightknit, small communities in the Midwest and were well grounded. Even though their companies spent years on legal battles before agreeing to cross-license patents, Kilby and Noyce were generous about sharing credit. When Kilby was told that he had won the Nobel Prize in Physics in 2000, 10 years after Noyce had died, among the first things he did was praise Noyce. “I’m sorry he’s not still alive,” he told reporters. “If he were, I suspect we’d share this prize.” When a Swedish physicist introduced him at the ceremony by saying that his invention had launched the Digital Revolution, Kilby displayed his aw-shucks humility. “When I hear that kind of thing,” he responded, “it reminds me of what the beaver told the rabbit as they stood at the base of Hoover Dam: ‘No, I didn’t build it myself, but it’s based on an idea of mine.’”









## 1.The Jet Engine



1958 Pan Am inaugurates daily Boeing 707 service across the Atlantic.

Commercial jet: 2,118 miles

Something about the human spirit compels us to go faster and farther. That's why Howard Hughes spent 1935 risking his life flying experimental planes to break speed barriers and why he took even graver risks in 1938 to fly around the world in record time. Hughes had everything to lose—fame, fortune, beautiful girlfriends, some might say his mind—and yet he needed to know what his machines could do.

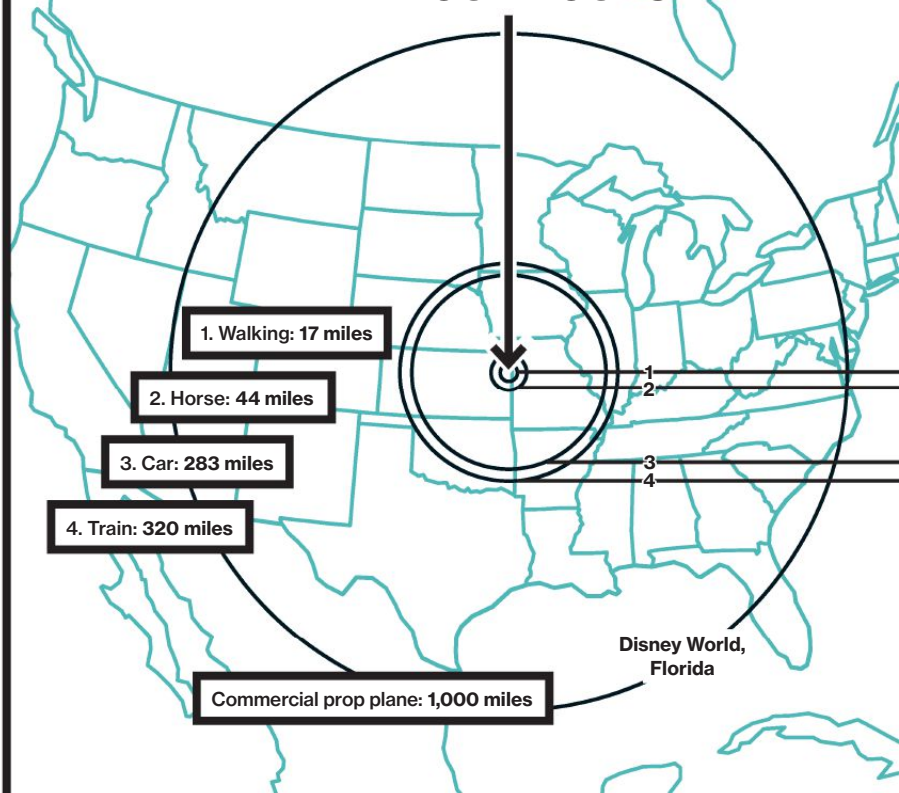
In the decades that followed, crisscrossing the globe turned from a daredevil feat into a regular occurrence. The jet engine had made its way out of the labs and into daily life. These new engines were far more powerful than propellers and allowed airplanes to travel faster and farther and—crucially—to do so reliably. Hughes, Pan Am's Juan Trippe, and others were quick to seize on the opportunity and built airline empires. The military began ordering fighter jets by the tens of thousands, and companies such as General Electric rushed to meet the demand.

By the 1960s this one invention had shrunk the world. For the first time the entire surface of the planet was reachable—or at least viewable—and its wonders opened up. Food, art, leisure, commerce, and relationships were redefined. Life became richer and more hectic. Jet travel created true global citizens while also making it easier to conduct war and spread disease.

And yet for all the changes the jet engine brought about, it's remarkable how static the technology has become. Militaries have developed engines that can break the speed of sound, but the public has benefited little from such work. The Concorde came and went. Boeing spent more than \$32 billion to build the 787, which is 20 percent more fuel-efficient than its predecessor but not much faster. GE is filling its engines with sensors and software in the hope of wringing another percentage point of performance here and there. Figures such as Hughes and Trippe have been replaced by low-cost airline execs like Ryanair's Michael O'Leary, who test the limits of what humans will tolerate rather than what humans can achieve. Some of this is physics, but surely some of it is complacency, too.

The good news is that there are still people pushing boundaries. Some companies are looking at ways to revive Concorde-type jets and upgrade them with see-through cabins. Elon Musk, the SpaceX and Tesla Motors chief executive officer, wants to build an all-electric supersonic plane that can take off and land vertically. This would allow cities to locate their airports more centrally. Musk has shared his concept with Google co-founders Sergey Brin and Larry Page, and the trio has even talked about one-upping the idea to create passenger craft that could reach space, shaving hours off flight times. Here's hoping there's always a young Howard Hughes somewhere willing to give such madness a try. —Ashlee Vance

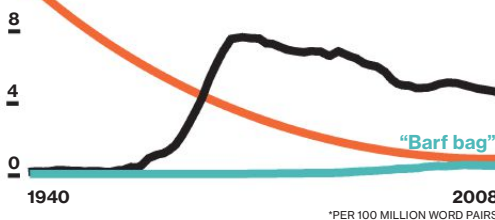
## HOW FAR YOU CAN GO FROM KANSAS CITY, MO., IN FOUR HOURS



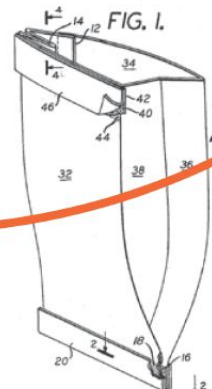
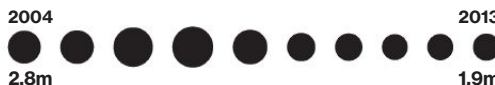
Pack a magazine Expressjet's 6:30 p.m. flight from Shreveport, La., to Dallas is late 73

### "JET SET"

Frequency of use in published works\*



### MISHANDLED BAGS



The "air sickness bag" was patented in 1964

### GLOBAL JET AIRCRAFT FLEET

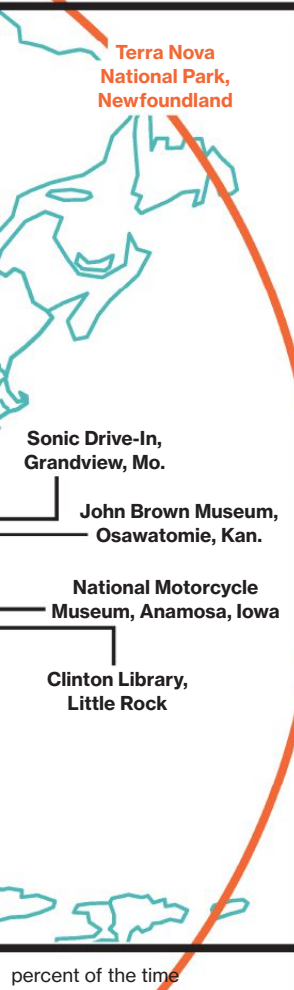
10 → 163 → 24,941

Number of jets in 1952

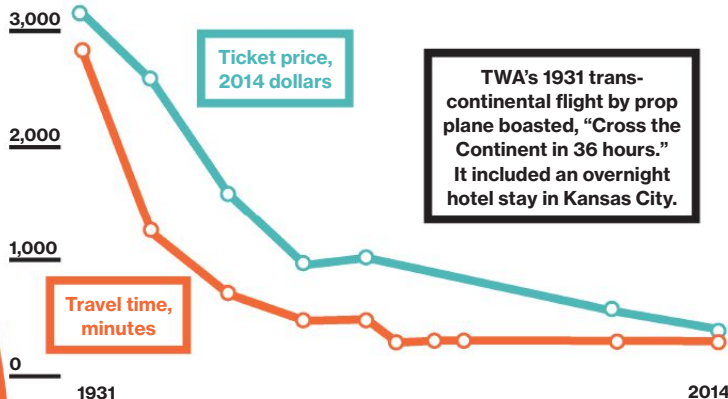
In 1959, a 394% increase from 1958

In 2013, a 3% rise for the fifth straight year

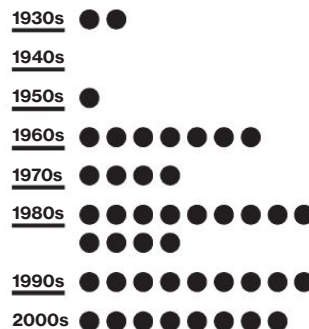
DATA: KANSAS CITY: UNITED AIRLINES; FEDERAL RAILWAY ADMINISTRATION; FEDERAL HIGHWAY ADMINISTRATION; OAK RIDGE NATIONAL LABORATORY; GOOGLE EARTH; DAFT LOGIC DISTANCE CALCULATOR; PACK A MAGAZINE: U.S. DEPARTMENT OF TRANSPORTATION; PASSENGER TRAFFIC: AIRLINES FOR AMERICA; AIRCRAFT FLEET; JET INFORMATION SERVICES; AIRLINE MERGERS: AIRLINES FOR AMERICA; FLIGHT LENGTH: QANTAS; JAUNTED.COM; TRANSPORTATION FATALITIES: U.S. DEPARTMENT OF TRANSPORTATION; PASSPORTS: U.S. DEPARTMENT OF STATE; SECRETARY OF STATE: U.S. DEPARTMENT OF STATE; OFFICE OF THE HISTORIAN; NEW YORK TO LOS ANGELES: TWA TIMETABLES; TIMETABLEIMAGES.COM; U.S. DEPARTMENT OF TRANSPORTATION; BLOODY MARY: GOGOIR.COM; BARF BAG PATENT: IFCI CLAIMS PATENT SERVICES; THE JET SET: GOOGLE NGRAM VIEWER; MISHANDLED BAGS (U.S. DOMESTIC TRAVEL ONLY): U.S. DEPARTMENT OF TRANSPORTATION; PEANUTS: SKIFT.COM; CORPORATE JETS: CORPORATE JET INVESTOR; DUTY-FREE: DUBAI DUTY FREE



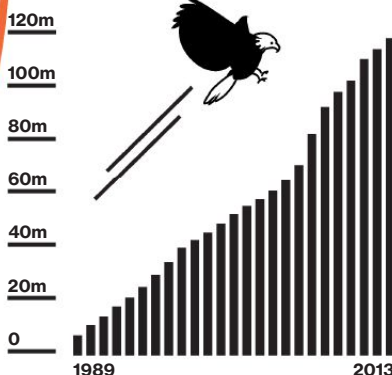
## NEW YORK TO LOS ANGELES



## AIRLINE MERGERS



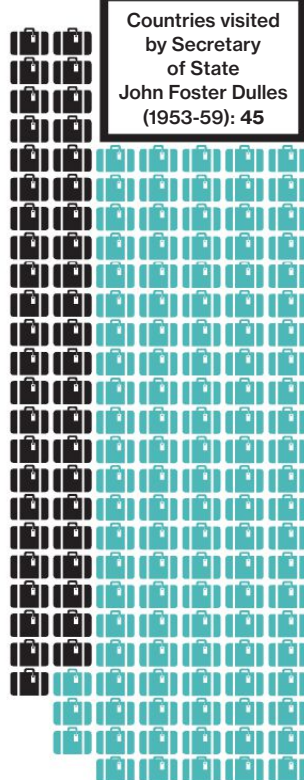
## U.S. PASSPORTS IN CIRCULATION



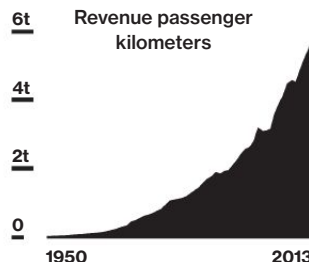
**Longest commercial flight:** Dallas to Sydney, 15-plus hours. \$1,999

**Shortest:** Westray to Papa Westray, Scotland, 47 seconds. \$27

## AIRBORNE DIPLOMACY



## PASSENGER TRAFFIC



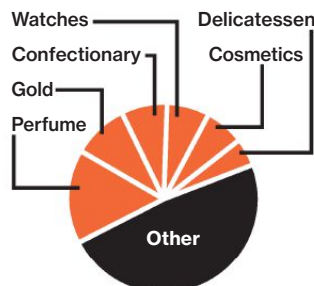
## BUSINESS JETS

**Number of registrations, 2014**

1 U.S.	12,051
2 Brazil	764
3 Mexico	704
4 Canada	483
5 Germany	387

## DUTY-FREE IN DUBAI

**\$1.8b in total sales, 2013**



## U.S. TRANSPORTATION FATALITIES BY MODE

**In 2012**

**Highway**

**Rail** — 557  
**Air** — 447

**88.3**

**MILLION**

**Number of bags of free peanuts handed out by Southwest Airlines in 2012**

**30%**

**The drop in taste perception while flying because of airplane noise, which helps make the Bloody Mary a favorite drink**



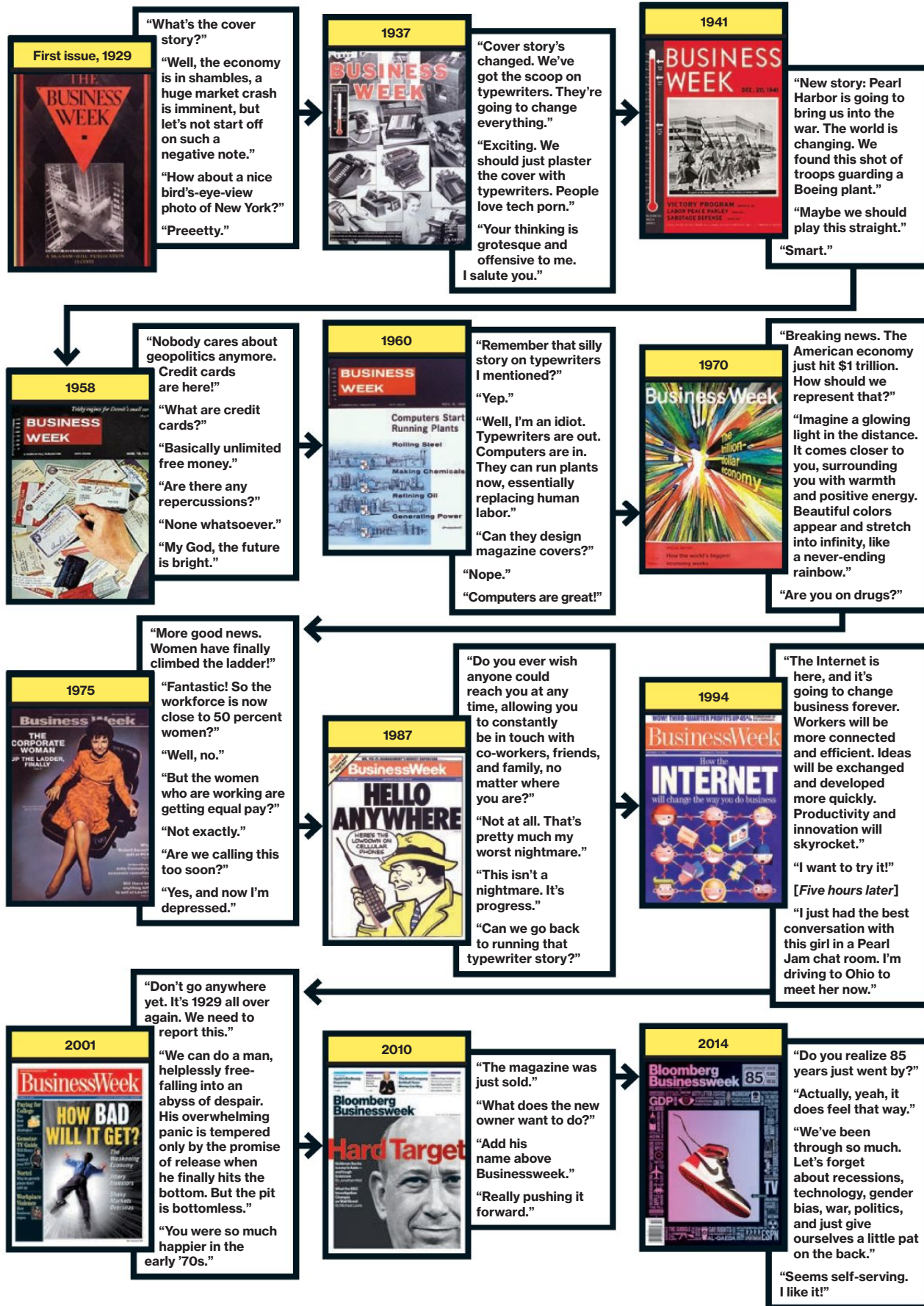
**DIY Bloody Mary**  
**Bring:** Lemon wedges, hot sauce packet, soy sauce packet, salt & pepper  
**Order on board:** Bottle of vodka, can of tomato juice, and cup of ice  
**Directions:** Pour vodka and half of the tomato juice over ice with a few drops each of soy and hot sauce. Add salt and pepper and a squeeze of lemon. Drink and enjoy!  
**You are still on an airplane.**





# COVER TRAIL

How the cover gets made,  
85th anniversary edition



**Bloomberg BusinessWeek** (USPS 080 900) December 8 - December 14, 2014 (ISSN 0007-7159) 5 issue no. 4406. Published weekly, except one week in March, June, August, and December, by Bloomberg L.P. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Executive, Editorial, Circulation, and Advertising Offices: Bloomberg BusinessWeek, 731 Lexington Avenue, New York, NY 10022. POSTMASTER: Send address changes to Bloomberg BusinessWeek, P.O. Box 37588, Boone, IA 50037-0528. Canada Post Publication Mail Agreement Number 41989020. Return undeliverable Canadian addresses to DHL Global Mail, 355 Admiral Blvd., Unit 4, Mississauga, ON L5T 2N1. E-mail: [bvkcustserv@cdsfulfillment.com](mailto:bvkcustserv@cdsfulfillment.com). Registered for GST as Bloomberg L.P. GST #R12829 9898 RT0001. Copyright 2014 Bloomberg L.P. All rights reserved. Title registered in the U.S. Patent Office. Single Copy Sales: Call 800 298-9987 or e-mail: [busweek@bnnmcinc.com](mailto:busweek@bnnmcinc.com). Subscriber Services: Call 800 635-1200 or log on to our website: <http://www.businessweek.com/customer/manage.htm>. Educational Permissions: Copyright Clearance Center at [info.copyright.com](http://info.copyright.com) Reprints & General Permissions: The YGS Group at 800 290-5460 x100 or [businessweekreprints@theYGSgroup.com](mailto:businessweekreprints@theYGSgroup.com). PRINTED IN THE U.S.A. CPPAP NUMBER 0414N6830



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